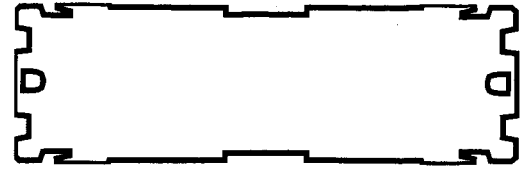


Service  
Service  
**Service**



# Service Manual

12 V 

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## GENERAL

The Carradio modul 22DC785/23B is part of the BMW System and does not work standalone.  
To run this modul you have to build up a system with:

- boardmonitor control unit (22SY401) for control of audio and tape deck functions
- boardmonitor control unit and videomodul for audio and display functions
- all modules shown in the systemconfiguration for full operation
- RS 232 - I Bus interface, PC and communication software to simulate functions

For controls, functions and service mode see also Service Manual of 22SY401 (4822 725 23519).

If there are any problems in servicing the set send it to: Philips Apparatefabrik Wetzlar  
Department SP-CS  
Philipsstrasse 1  
D-35576 Wetzlar  
GERMANY

## TECHNICAL DATA

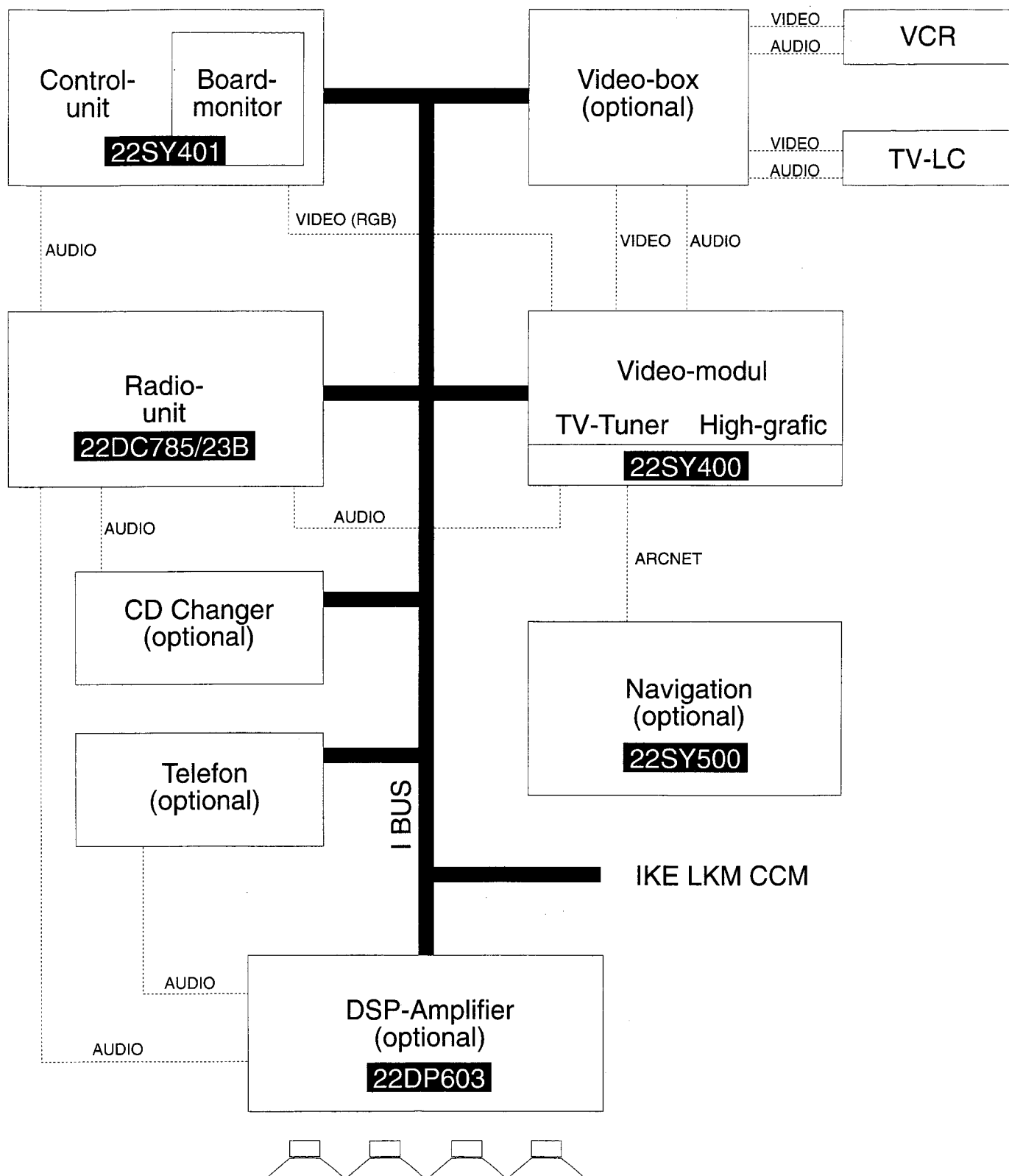
GENERAL	Power supply:	9 V - 16 V	
	Quiescent current:	< 2 mA	
	Standby current:	< 500 mA	
	Maximum current:	4 A	
TUNER	FM	87.5 - 108 MHz	grid: 100 kHz search, 100 kHz manual
	MW	531 - 1602 kHz	grid: 9 kHz search, 9 kHz manual
	LW	153 - 279 kHz	grid: 9 kHz search, 1 kHz manual
	SW	5.9 - 6.25 MHz	grid: 5 kHz search, 5 kHz manual
	Presets:	6 FM1, 6 FM2, 6 FM-AST, 6 MW 6 LW, 6 SW	
	IF (FM / AM):	10.7 MHz	
	Sensitivity 26 dB S/N:	FM: 4 µV MW: 28 µV LW: 56 µV SW: 28 µV	
	AMPLIFIER	Output:	4 x 4,5 W sinus (at 10% THD)
Bass:		+/- 12 dB (100 Hz), 2 dB steps	
Treble:		+/- 12 dB (10 kHz), 2 dB steps	
Channel separation:		>> 30 dB	
Telefonmute		>> -40 dB	

## DEFAULT SETTINGS (Delivery status)

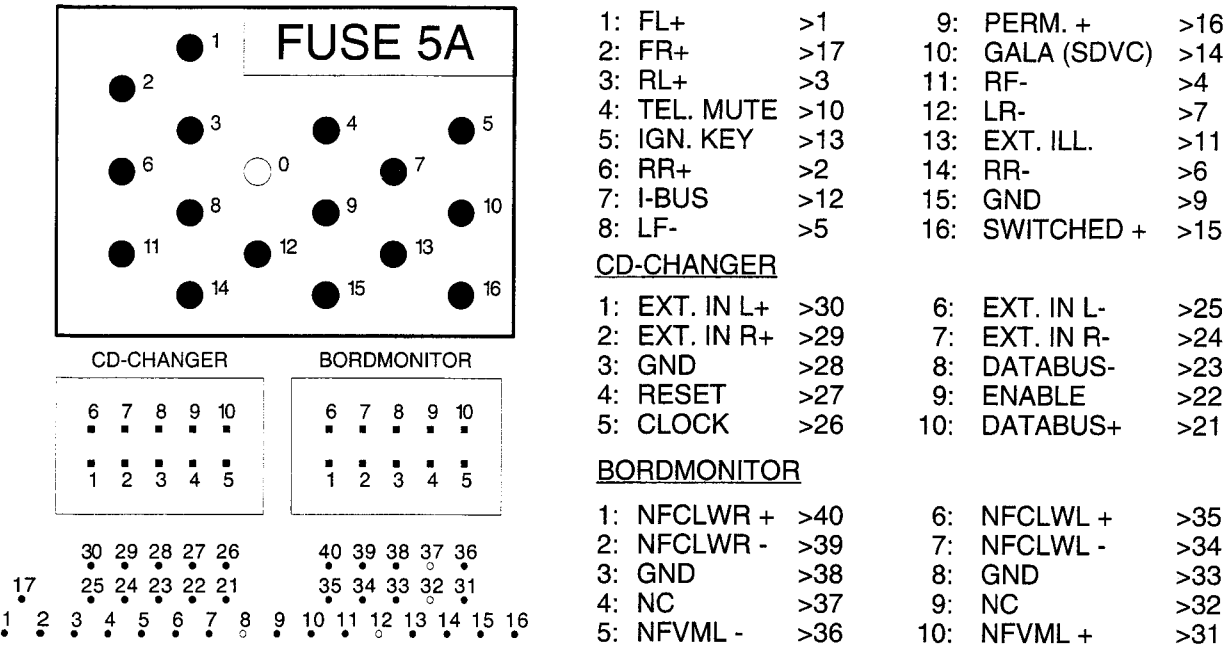
Volume:	100 mV (FM, dF 0 22,5 KHz, fmod = 1 KHz)
Tone:	All tone controls in center position
Radio mode:	FM1, RDS on, REG off, TP off, SCAN off
Cassette mode:	Nor direction (TAPE 1), Dolby off, MSS off
Service mode:	GAL = 2, SEEK = 1, TP-V = 0

# Radio Modul 22DC785/23B

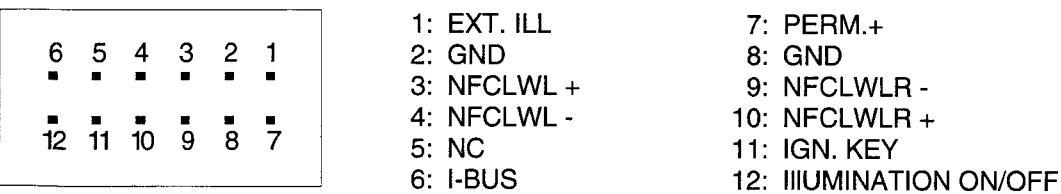
## Systemconfiguration



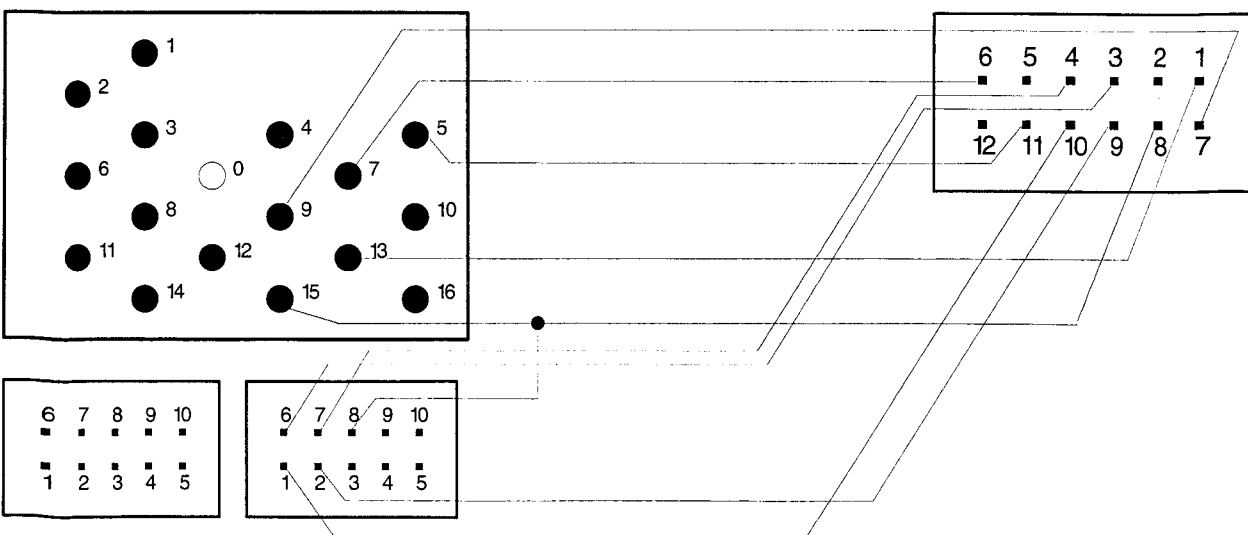
# Connector pos.1010 of 22DC785/23B



# Connector pos.1006 of 22SY401

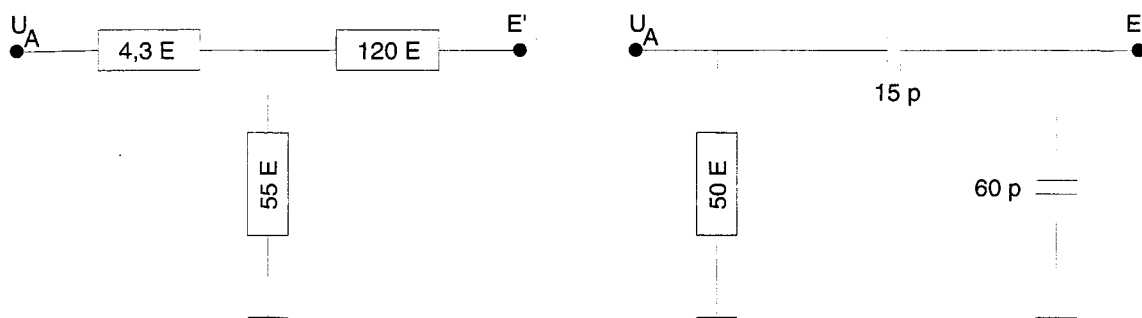


# Adaptercable





For adjustments and checks use the dummy aerials as shown in the figures, levels mentioned in the tables are  $U_A$  values









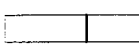

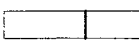

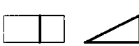

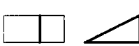



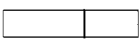

Adjustment	Band					
$\alpha$ - 3 dB	FM	98,0 MHz, 1 mV $\Delta f = 22,5$ KHz $f_{mod} = 1$ KHz			Connectorblock PIN 1 + PIN 2	1,4 V => Referencelevel (dB)
		98,0 MHz, 10 $\mu$ V $\Delta f = 22,5$ KHz $f_{mod} = 1$ KHz				Referencelevel - 3 dB
Channel - separation 6dB crosstalk	FM	98,0 MHz, 200 $\mu$ V $\Delta f = 40$ KHz $f_{mod} = 1$ KHz (right channel only) Stereo-Pilot 10%		R 3630	Connectorblock PIN 1 <-> PIN 2	6 dB (+/- 1 dB)
Channel - separation 26db crosstalk	FM	98,0 MHz, 640 $\mu$ V $\Delta f = 40$ KHz $f_{mod} = 1$ KHz (right channel only) Stereo-Pilot 10%		R 3115	Connectorblock PIN 1 <-> PIN 2	26 dB (+/- 1 dB)
Channel - separation maximum	FM	98,0 MHz, 4 mV $\Delta f = 40$ KHz $f_{mod} = 1$ KHz (right channel only) Stereo-Pilot 10%		R 3608	Connectorblock PIN 1 <-> PIN 2	> 30 dB
<b>Check <math>\alpha</math>-3 db again and adjust if neccessary</b>						
<b>Do not adjust coils 5210 and 5228 (AM-PART), because they are correctly preadjusted by supplier !</b>						
Noise - detector	FM	98,0 MHz, 1 mV $\Delta f = 70$ KHz $f_{mod} = 40$ KHz		R 3426	IC 7420 PIN 14	1,4 V <sub>eff</sub>

#### NOTE

FM- and AM- search sensitivities as well as VOLUME-, GALA (SDVC)- and TA-levels are only programable with a special equipment and software.

If you get sets with this adjustments out of specification, send them to factory-service in Wetzlar until further notice.

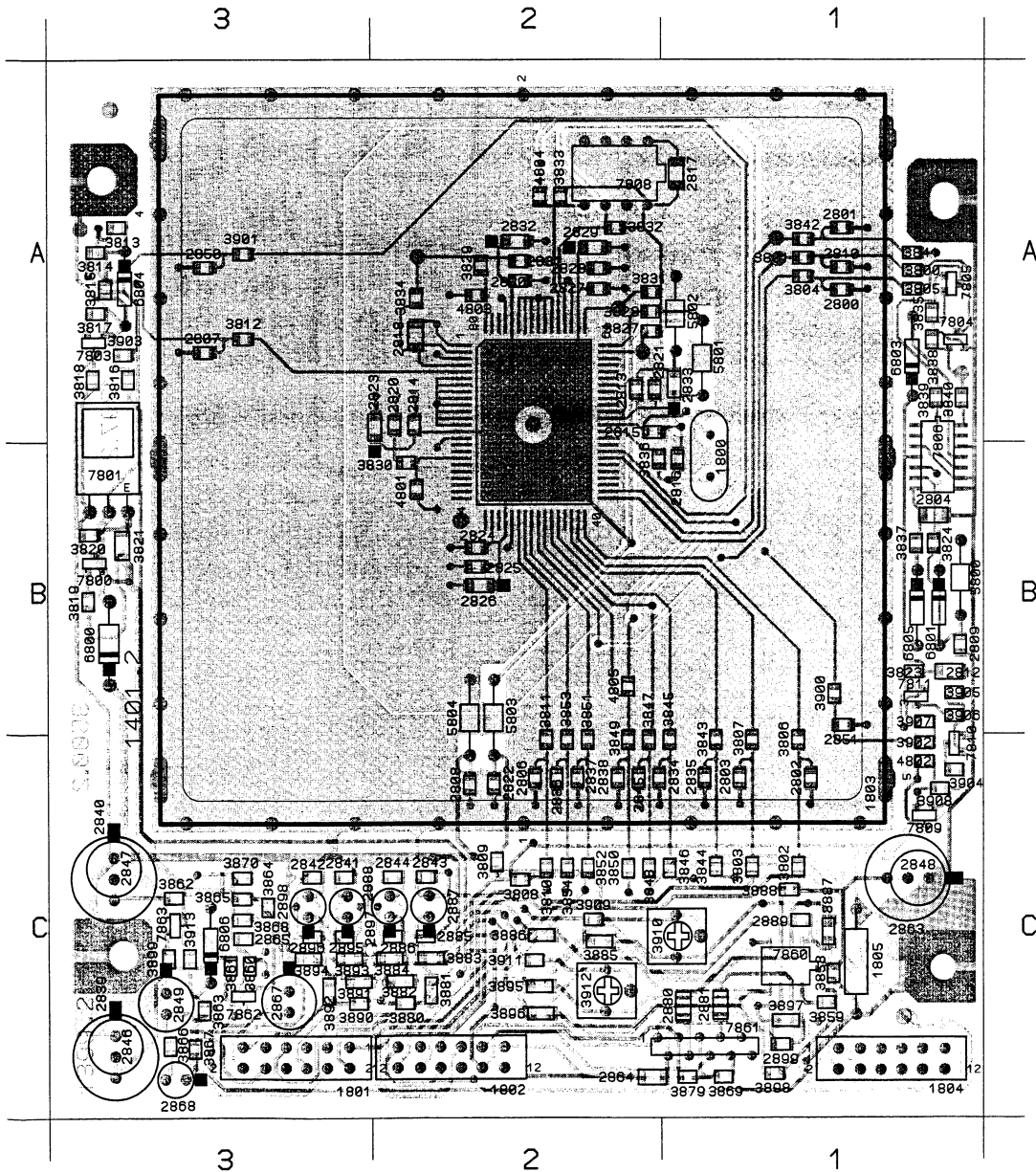
Philips Apparatefabrik Wetzlar  
Department SP-CS  
Philipsstrasse 1  
D - 35576 Wetzlar  
GERMANY

Check	Band					
Demodulated FM - level	FM	98 MHz, 1 mV $\Delta f = 22,5 \text{ KHz}$ $f_{\text{mod}} = 1 \text{ KHz}$			FM 1008 PIN 2	160 mV
		98 MHz, 1 mV $\Delta f = 6,75 \text{ KHz}$ $f_{\text{mod}} = 19 \text{ KHz}$				45 mV
		98 MHz, 1 mV $\Delta f = 3,75 \text{ KHz}$ $f_{\text{mod}} = 57 \text{ KHz}$				20 mV
Demodulated AM - level	AM	1053 KHz, 1 mV 1 KHz, 30% AM			IC 7201 PIN 12	180mV - 360mV
Varicap-voltage	AM				153 KHz IC 7251 PIN 15	> 1,5 V
					6250 KHz	< 6,0 V
	FM				87,5 MHz FM 1008 PIN 15	> 1,0 V
Tel. mute	FM	98,0 MHz, 1 mV $\Delta f = 22,5 \text{ KHz}$ $f_{\text{mod}} = 1 \text{ KHz}$			Connectorblock PIN 1 + PIN 2	< 7,5 V 1,4 V => Referencelevel (dB)
		Connectorblock: connect PIN4 to GND				Referencelevel < - 60 dB
Noise limited sensitivity S/N 26 dB	FM	98,0 MHz, 5 $\mu\text{V}$ $\Delta f = 22,5 \text{ KHz}$ $f_{\text{mod}} = 1 \text{ KHz}$			Connectorblock PIN 1 + PIN 2	1,4 V => Referencelevel (dB)
		98,0 MHz, 5 $\mu\text{V}$ $\Delta f = 22,5 \text{ KHz}$ unmodulated				Referencelevel - 26 dB
	MW	1053 KHz, 140 $\mu\text{V}$ 30 % mod., 1KHz				80 mV => Referencelevel (dB)
		1053 KHz, 140 $\mu\text{V}$ unmodulated				Referencelevel - 26 dB
	LW	207 KHz, 250 $\mu\text{V}$ 30 % mod., 1KHz				80 mV => Referencelevel (dB)
		207 KHz, 250 $\mu\text{V}$ unmodulated				Referencelevel - 26 dB
	SW	6,1 MHz, 140 $\mu\text{V}$ 30 % mod., 1KHz				80 mV => Referencelevel (dB)
		6,1 MHz, 140 $\mu\text{V}$ unmodulated				Referencelevel - 26 dB
Wide band AGC switch	AM	999 KHz, 10 mV without modulation			IC 7201 PIN 1	V1 $\approx$ 6,5 V
		999 KHz, 2 V without modulation				V2 $\approx$ 7,0 V V2-V1 > 0,5 V
Search - sensitivities	FM	98,0 MHz, 100 $\mu\text{V}$ $\Delta f = 22,5 \text{ KHz}$ $f_{\text{mod}} = 1 \text{ KHz}$		SEEK 2	Local	$t_{\text{start-stop}} < 20 \text{ s}$
		50 $\mu\text{V}$		SEEK 1	Local	$t_{\text{start-stop}} < 20 \text{ s}$
		10 $\mu\text{V}$		SEEK 2	DX	$t_{\text{start-stop}} < 20 \text{ s}$
		5 $\mu\text{V}$		SEEK 1	DX	$t_{\text{start-stop}} < 20 \text{ s}$
	AM	1053 KHz, 600 $\mu\text{V}$ without modulation		Local		$t_{\text{start-stop}} < 15 \text{ s}$
		35 $\mu\text{V}$		DX		$t_{\text{start-stop}} < 15 \text{ s}$

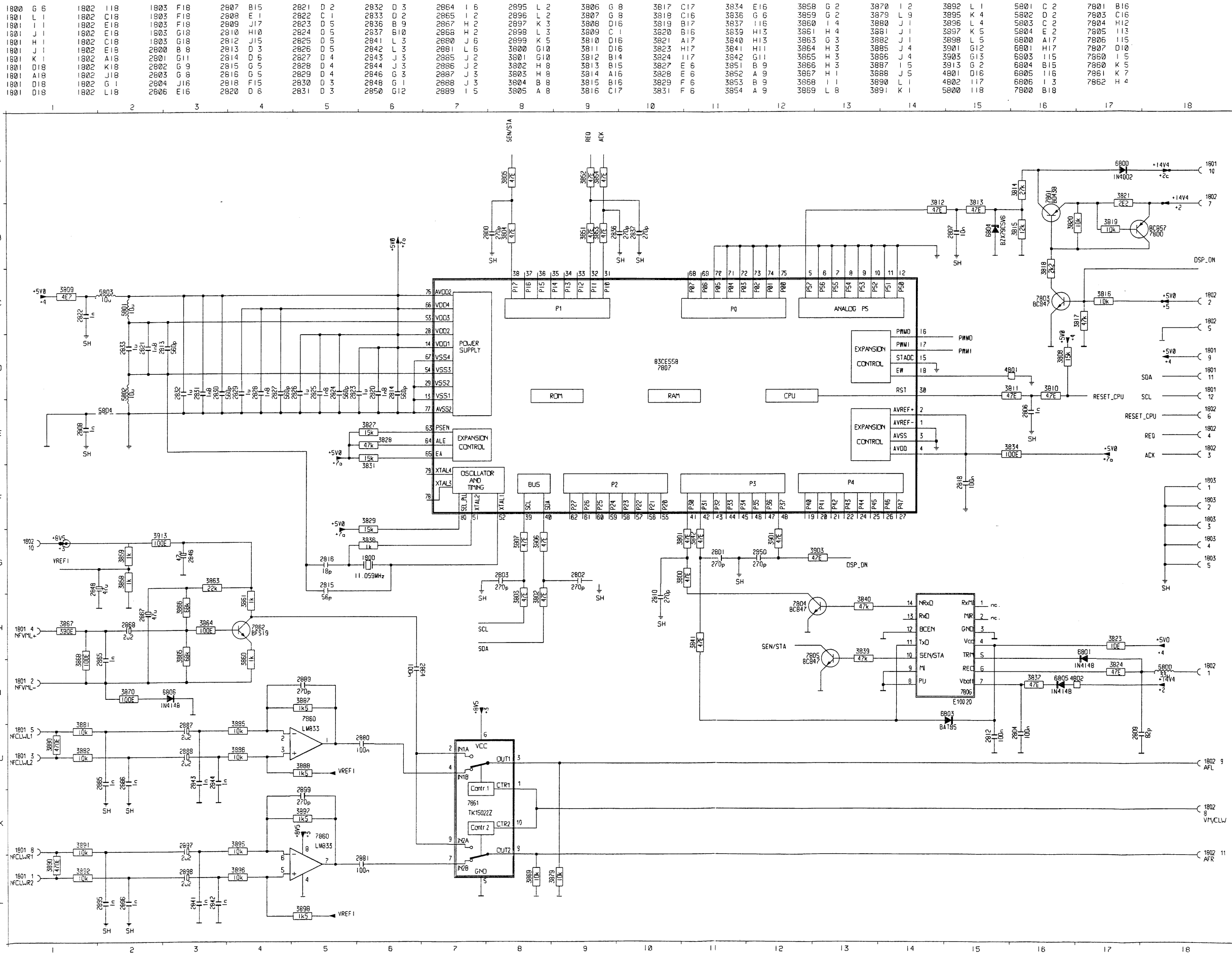
## WIRING DIAGRAM 22DC785/23B

# I/O PWB

1800 B 1	2823 A 2	2848 C 1	3804 A 1	3833 A 2	3863 C 3	3897 C 1	5803 B 2
1801 C 2	2824 B 2	2849 C 3	3805 A 1	3834 A 2	3864 C 3	3898 C 1	5804 B 2
1802 C 2	2825 B 2	2850 A 3	3806 B 1	3836 B 2	3865 C 3	3899 C 3	6800 B 3
1803 B 3	2826 B 2	2851 C 1	3807 B 1	3837 B 1	3866 C 3	3900 B 1	6801 B 1
1804 C 1	2827 A 2	2863 C 1	3809 C 2	3839 A 1	3867 C 3	3901 A 3	6803 A 1
2800 A 1	2828 A 2	2864 C 2	3810 C 2	3840 A 1	3868 C 3	3902 C 1	6804 A 3
2801 A 1	2829 A 2	2865 C 3	3811 B 2	3841 A 1	3869 C 1	3903 A 3	6805 B 1
2802 C 1	2830 A 2	2867 C 3	3812 A 3	3842 A 1	3870 C 3	3904 C 1	6806 C 3
2803 C 1	2831 A 2	2868 C 3	3813 A 3	3843 B 1	3879 C 1	3905 B 1	7800 B 3
2804 B 1	2832 A 2	2880 C 1	3814 A 3	3844 C 1	3880 C 2	3906 B 1	7801 B 3
2806 C 2	2833 A 1	2881 C 1	3815 A 3	3845 B 1	3881 C 2	3907 B 1	7803 A 3
2807 A 3	2834 C 1	2885 C 2	3816 A 3	3846 C 1	3882 C 2	3908 C 1	7804 A 1
2808 C 2	2835 C 1	2886 C 2	3817 A 3	3847 B 2	3883 C 2	3909 C 2	7805 A 1
2809 B 1	2836 C 2	2887 C 2	3818 A 3	3848 C 2	3884 C 2	3910 C 1	7806 B 1
2810 A 1	2837 C 2	2888 C 2	3819 B 3	3849 B 2	3885 C 2	3911 C 2	7807 A 2
2812 B 1	2838 C 2	2889 C 1	3820 B 3	3850 C 2	3886 C 2	3912 C 2	7808 A 2
2813 A 2	2839 C 3	2895 C 3	3821 B 3	3851 B 2	3887 C 1	3913 C 3	7809 C 1
2814 A 2	2840 C 3	2896 C 3	3823 B 1	3852 C 2	3888 C 1	4801 B 2	7810 C 1
2815 A 2	2841 C 3	2897 C 3	3824 B 1	3853 B 2	3890 C 3	4802 C 1	7811 B 1
2816 B 1	2842 C 3	2898 C 3	3827 A 2	3854 C 2	3891 C 2	4803 A 2	7860 C 1
2817 A 1	2843 C 2	2899 C 1	3828 A 2	3858 C 1	3892 C 3	4804 A 2	7861 C 1
2818 A 2	2844 C 2	3800 A 1	3829 A 2	3859 C 1	3893 C 3	4805 B 2	7862 C 3
2820 A 2	2845 C 2	3801 A 1	3830 B 2	3860 C 3	3894 C 3	5800 B 1	7863 C 3
2821 A 2	2846 C 3	3802 C 1	3831 A 2	3861 C 3	3895 C 2	5801 A 1	
2822 C 2	2847 C 3	3803 C 1	3832 A 2	3862 C 3	3896 C 2	5802 A 1	



# I/O CIRCUIT



Measured with U<sub>supply</sub> = 12V, Mode FM

**POS. 7800 BC857**  
 B: 12.0 V  
 C: 11.8 V  
 E: 12.0 V

**POS. 7801 BD438**  
 B: 12.0 V  
 C: 12.0 V  
 E: 11.8 V

**POS. 7803 BC847**  
 B: 0.7 V  
 C: 0.0 V  
 E: 0.0 V

**POS. 7804 + 7805 BC847**  
 B: 0.0 V  
 C: 5.0 V  
 E: 0.0 V

**POS. 7806 E10020**  
 1: 2.0 V  
 3: GND  
 4: 5.0 V  
 5: 11.0 V  
 6: 11.3 V  
 7: 12.0 V  
 8: GND  
 10: 0.0 V  
 11: 5.0 V  
 12: GND  
 13: nc  
 14: 0.0 V

**POS. 7807 83CE558**  
 1: GND  
 2: 4.8 V  
 3: GND  
 4: 4.8 V  
 5: 3.8 V  
 6-12: GND  
 13: 25 mV  
 14: 5.0 V  
 15: GND  
 16, 17: 5.0 V  
 18: GND  
 19-27: nc  
 28: 5.0 V  
 29: 25 mV  
 30: 40 mV  
 31, 32: 5.0 V  
 33-37: nc  
 38: 5.0 V  
 39: 4.6 V  
 40-42: 5.0 V  
 43-47: nc  
 48: 0.7 V  
 49, 50: nc  
 51: 2.5 V  
 52: 2.0 V  
 53: 5.0 V  
 54: 0.0 V  
 55-62: nc  
 63: 5.0 V  
 64: 30 mV  
 65, 66: 5.0 V  
 67: 25 mV  
 68, 69: nc  
 70-75: GND  
 76: 5.0 V  
 77: 25 mV  
 78, 79: nc  
 80: 5.0 V

**POS. 7860 LM833**  
 1-3: 4.2 V  
 4: GND  
 5-7: 4.2 V  
 8: 8.5 V

**POS. 7861 TK15022Z**  
 1: 50 mV  
 2-4: 4.3 V  
 5: GND  
 6: 8.5 V  
 7-9: 4.3 V  
 10: 50 mV

**POS. 7862 BFS19**  
 B: 3.3 V  
 C: 6.5 V  
 E: 2.6 V

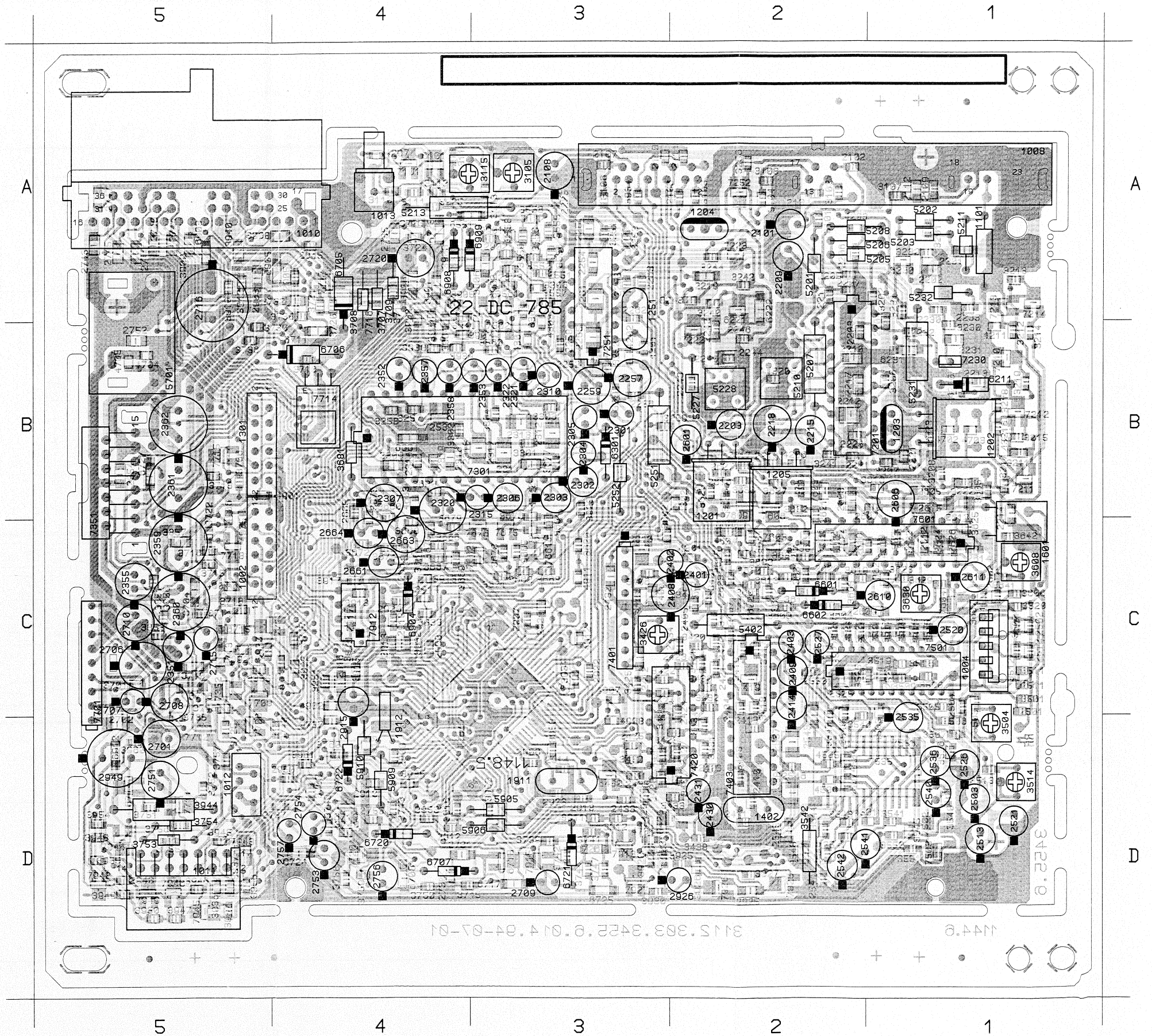


PCS 79 898

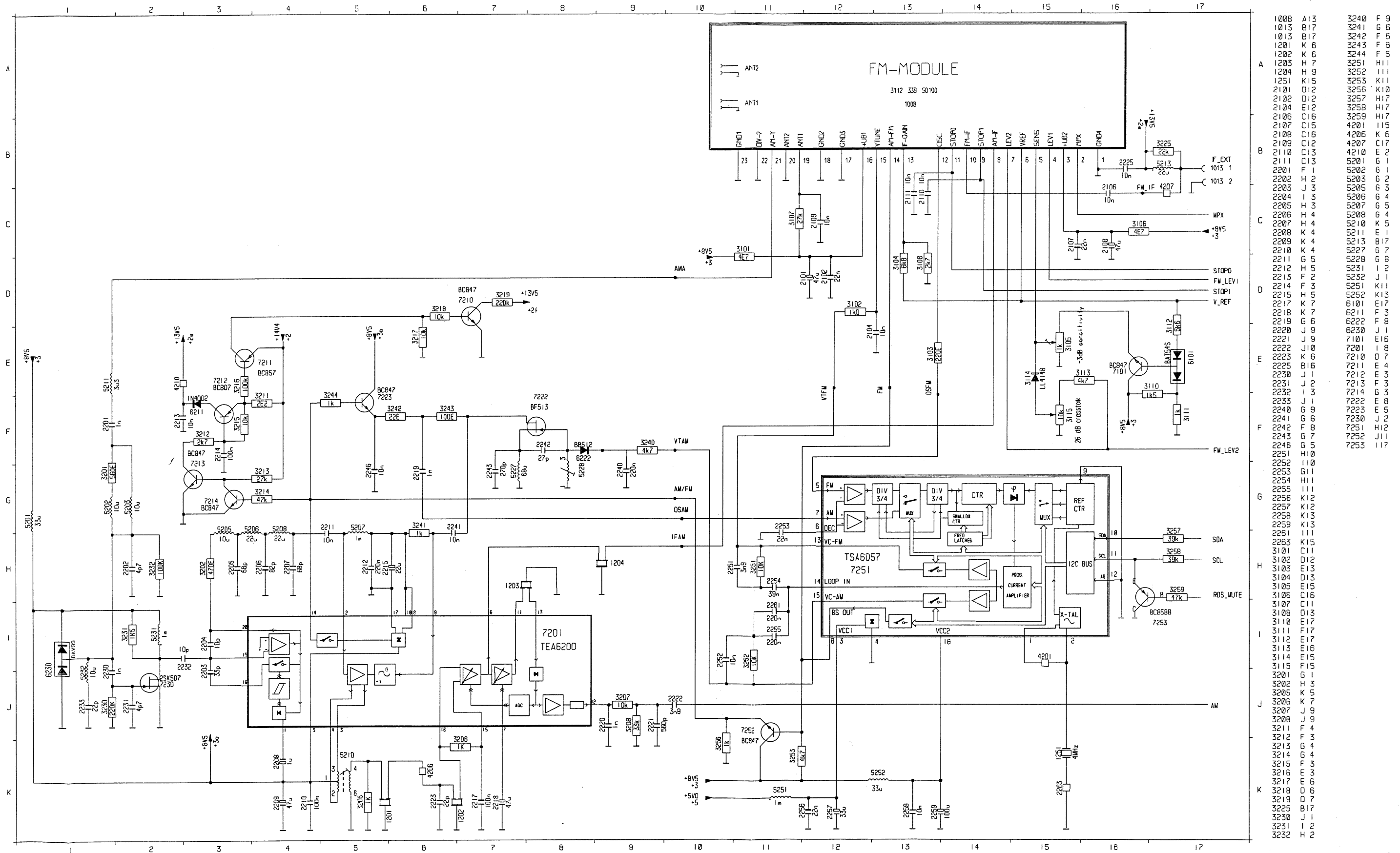


MAIN PWB - TOP SIDE VIEW

3540 D 1	3672 C 4	3916 D 4	4905 B 5	6909 A 4
3541 D 1	3673 B 4	3917 C 4	4906 B 5	6910 C 3
3542 D 2	3674 C 4	3918 C 4	4907 C 3	6912 D 5
3543 D 2	3675 C 3	3919 C 4	4908 D 3	7101 A 4
3544 D 2	3676 B 3	3920 C 5	4910 D 4	7201 B 2
3545 D 1	3677 B 3	3921 C 5	4911 C 3	7210 B 1
3546 D 2	3678 C 3	3922 C 4	4912 C 3	7211 B 1
3547 D 2	3679 C 4	3923 B 3	5201 A 2	7212 B 1
3548 D 2	3680 B 4	3924 C 4	5202 A 1	7213 A 1
3550 D 1	3681 B 4	3925 D 2	5203 A 1	7214 A 1
3551 D 1	3701 C 5	3926 D 2	5205 A 2	7222 B 2
3552 A 3	3702 D 4	3927 D 2	5206 A 2	7223 A 2
3553 A 3	3706 B 5	3928 D 3	5207 B 2	7230 B 1
3554 A 3	3707 A 4	3929 D 3	5208 A 2	7251 A 3
3555 A 3	3708 A 4	3930 D 3	5210 B 2	7252 A 2
3556 A 3	3709 A 4	3931 C 3	5211 A 1	7253 B 4
3557 A 3	3710 B 4	3932 C 4	5213 A 4	7301 B 4
3558 A 3	3713 B 5	3933 C 4	5227 B 2	7302 A 3
3559 A 3	3714 C 5	3934 A 3	5228 B 2	7351 B 5
3560 B 3	3715 C 5	3935 D 4	5231 B 1	7352 C 5
3561 A 3	3716 C 5	3936 D 5	5232 A 1	7401 C 3
3601 C 2	3717 C 4	3937 D 5	5251 B 3	7403 D 2
3602 C 3	3718 C 5	3938 B 4	5252 B 3	7419 C 2
3603 C 2	3719 A 4	3939 B 4	5402 C 2	7420 D 2
3604 C 2	3720 A 4	3940 A 5	5701 B 5	7501 C 1
3605 B 1	3721 A 4	3941 A 4	5905 D 3	7502 D 1
3606 C 1	3722 C 5	3942 A 5	5906 D 3	7503 D 1
3607 C 1	3723 A 4	3944 D 5	5909 D 4	7535 D 1
3608 C 1	3724 A 4	3945 D 5	5910 D 4	7536 D 1
3609 C 2	3725 D 5	3946 D 5	6101 A 4	7601 C 1
3610 C 2	3730 B 5	3947 D 5	6203 B 1	7602 C 2
3612 C 2	3735 D 5	3948 D 5	6211 B 1	7603 C 2
3613 C 2	3736 B 5	3949 D 5	6221 A 2	7604 C 1
3614 C 2	3737 D 4	3950 D 5	6222 A 2	7605 B 2
3615 C 2	3738 A 4	3951 C 4	6230 A 1	7606 B 2
3616 B 1	3739 D 3	3952 D 3	6301 B 3	7609 B 2
3617 B 2	3740 D 4	3953 D 4	6420 D 2	7661 C 3
3619 C 2	3741 D 3	3954 D 5	6430 D 3	7662 C 3
3620 C 3	3742 D 3	3955 D 5	6551 A 3	7675 C 3
3621 C 1	3743 D 4	3956 D 5	6601 C 2	7676 C 3
3622 C 1	3744 D 3	3957 D 5	6602 C 2	7701 C 5
3623 C 1	3745 D 4	3958 D 3	6603 C 2	7706 D 5
3624 C 1	3746 C 5	3960 D 5	6661 B 4	7709 C 5
3625 C 1	3747 D 3	3961 D 4	6704 C 5	7711 D 5
3626 C 1	3748 D 4	4201 B 3	6705 A 4	7712 D 5
3627 B 2	3749 D 4	4202 B 3	6706 B 4	7714 B 4
3628 B 2	3750 D 4	4203 A 2	6707 D 4	7715 B 5
3629 C 1	3751 D 5	4206 B 2	6708 D 4	7716 A 4
3630 C 1	3752 D 5	4207 A 4	6710 C 5	7717 A 4
3631 C 2	3753 D 5	4210 B 1	6711 B 4	7718 C 5
3632 B 2	3754 D 5	4211 B 1	6713 C 5	7719 C 5
3633 C 2	3755 D 5	4301 C 2	6714 D 5	7720 D 4
3634 C 2	3756 D 5	4302 B 2	6715 C 5	7911 C 3
3635 C 2	3757 D 5	4303 B 3	6716 C 5	7912 C 4
3636 C 2	3758 D 4	4304 B 3	6717 D 3	7913 D 3
3638 B 2	3759 D 4	4501 D 1	6718 D 3	7915 D 3
3639 C 2	3760 D 4	4503 C 1	6719 D 4	7925 D 2
3640 B 2	3901 A 4	4504 D 2	6720 D 4	7926 D 2
3641 C 1	3902 A 4	4505 D 2	6721 D 3	7927 D 3
3642 C 1	3903 A 4	4506 D 2	6722 D 4	7943 D 5
3660 B 4	3904 A 4	4507 D 2	6723 A 4	7944 D 5
3661 C 4	3905 A 4	4602 B 3	6724 D 4	7945 D 5
3662 C 3	3906 A 4	4603 B 4	6725 D 3	7946 D 5
3663 C 3	3907 B 4	4604 C 2	6726 D 3	7948 D 5
3664 C 3	3908 A 4	4702 B 1	6727 B 5	7949 D 5
3665 C 3	3909 A 5	4703 B 1	6901 A 4	
3666 C 4	3910 A 5	4704 B 5	6902 A 3	
3667 C 4	3911 D 3	4705 B 5	6903 A 5	
3668 C 4	3912 D 3	4706 D 3	6904 C 4	
3669 C 4	3913 C 4	4901 B 5	6905 A 4	
3670 C 4	3914 C 4	4902 C 4	6906 A 4	
3671 C 3	3915 C 4	4904 C 5	6908 A 4	



## FM MODUL / AM PART / PLL SYNTHESIZER





FM MODUL/AM PART/PLL SYNTHESIZER

POS. 1008 FM MODULE

1: GND  
2: 3,0V  
3: 8,4V  
4: 2,4-4,0V (LEVEL DEP.)  
5: 1,6V  
6: 3,9V  
7: 1,1-4,4V (LEVEL DEP.)  
8: 1,8V  
9: 5,0V / LOW (SEARCH)  
10: 0,0V  
11: 5,0V / LOW (SEARCH)  
12: 1,9V  
13: 1,2V (FM) / 0,9V (AM)  
14: 0,3V (FM) / 8,3V (AM)  
15: 1,3V (87,5 MHz) ... 5,7V (108MHz)  
16: 8,2V (FM) / 8,4V (AM)  
17, 18: GND  
19: 6,9V (FM) / 4,5V (AM)  
20: GND  
21: 0,0V  
22, 23: GND

POS. 6101 BAT54S

1: 3,4V  
2: 3,7V  
3: 3,5V

POS. 6230 BAV99

(VALUES IN AM MODE)

1: 8,2V  
2: GND  
3: 0,0V

POS. 7101 BC847

B: 3,5V  
C: 8,5V  
E: 2,9V

POS. 7201 TEA6200

1: 6,7V / 7,2V (FM)  
2: 4,1V / 0,1V (FM)  
3-6: 8,2V / 8,4V (FM)  
7: ca. 1V (LEVEL DEP.)  
8-10: 4,1V / 0,1V (FM)  
11: 6,6V / 7,9V (FM)  
12: 2,4V / 0,0V (FM)  
13: 4,7V / 6,3V (FM)  
14: 7,7V / 0,2V (FM)  
15, 16: 4,8V / 0,0V (FM)  
17: GND  
18: 1,1V / 0,0V (FM)  
19: 1,3V / 0,7V (FM)  
20: 3,3V / 7,1V (FM)

POS. 7210 BC847

B: 0,0V  
C: 13,2V  
E: GND

POS. 7211 BC857

B: 13,7V  
C: 0,0V  
E: 13,8V

POS. 7212 BC807

B: 13,1V  
C: 13,8V  
E: 13,8V

POS. 7213 BC847

B: 0,8V  
C: 0,0V  
E: GND

POS. 7214 BC847

B: 0,0V  
C: 0,8V  
E: GND

POS. 7222 BF513

D: 5,6V  
G: 0,0V  
S: 0,1V

POS. 7223 BC847

B: 7,8V  
C: 8,3V  
E: 7,1V

POS. 7230 2SK507

D: 8,1V  
G: 0,1V  
S: GND

POS. 7251 TSA6057

1: 1,2Vtt (4MHz)  
2: 1,2Vtt (4MHz)  
3: 4,7V  
4: GND  
5-7: 1,8V  
8: 8,3V  
9: GND  
10, 11: 5,0V  
12: GND  
13: 1,5V (87,5MHz) ... 5,9V (108MHz)  
14: 2,3V  
15: 3,7V (153kHz) ... 6,5V (6250kHz)  
16: 8,7V

POS. 7252 BC847

B: 8,3V / 0,2V (FM)  
C: 8,4V  
E: 7,6V / 0,1V (FM)

POS. 7253 BC858B

B: 0,0V  
C: GND  
E: 0,6V

POS. 7601 TDA1591

1: 4,4V  
2: 4,3V  
3: GND  
4: 3,0V  
5: 8,3V  
6: 2,2V  
7: 2,2V / 0,0V (AM)  
8: 6,3V  
9-14: 3,8V  
15-17: 2,8V  
18: 5,0V  
19: 0,5V  
20: 3,0V

POS. 7602 BC847

B: 1,3...4,3V (LEVEL DEP.)  
C: 8,3V  
E: 0,0...3,8V (LEVEL DEP.)

POS. 7603 BC847

B: 0,0V  
C: 5,1V  
E: 0,0V

POS. 7604 BC847

B: 0,0V  
C: GND  
E: 0,0V

POS. 7605 BC847

B: 0,1V  
C: 2,1V  
E: GND

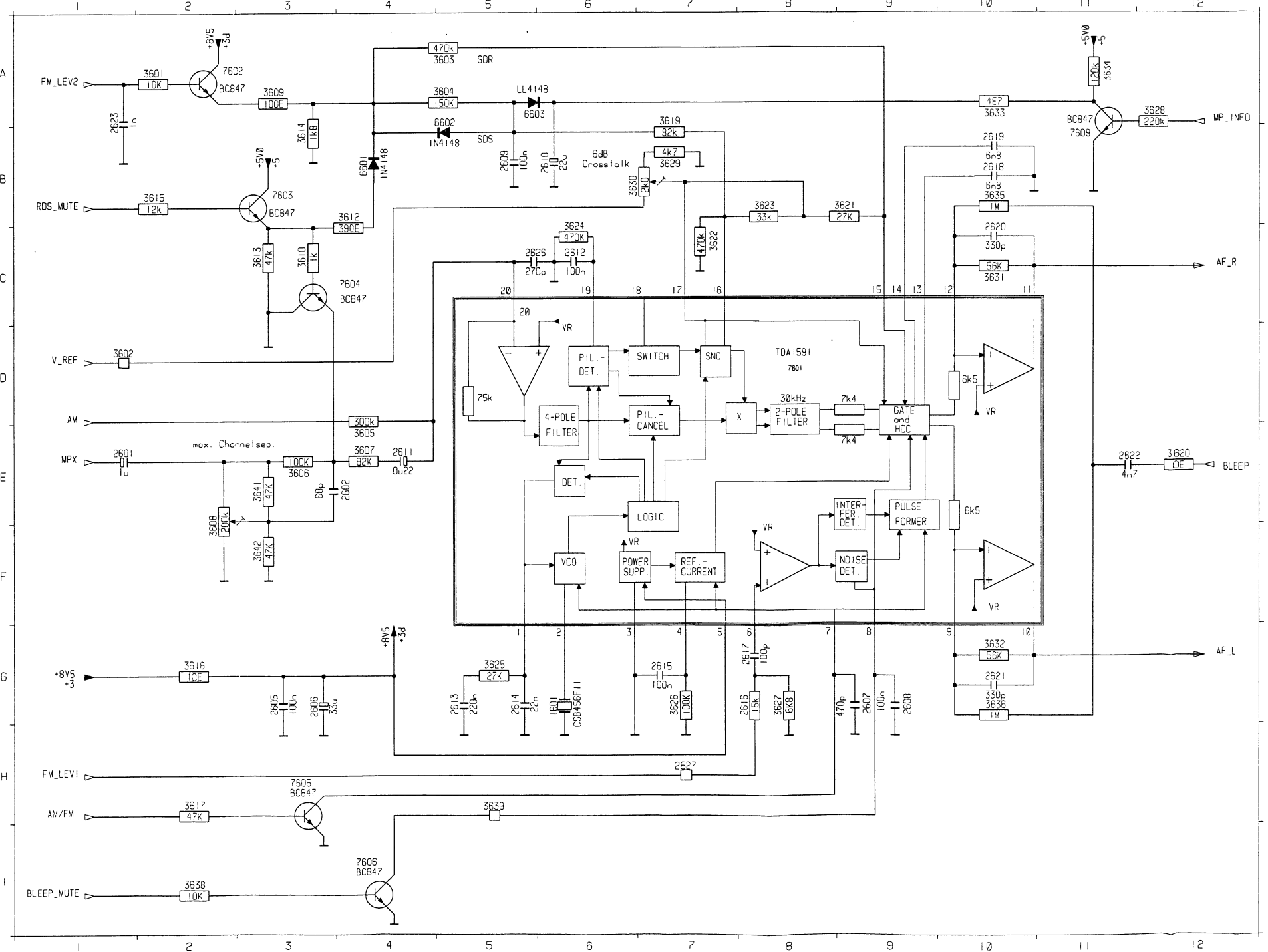
POS. 7606 BC847

B: 0,5V  
C: 4,4...6,3V (LEVEL DEP.)  
E: GND

POS. 7609 BC847

B: 0,0V  
C: 4,9V  
E: GND

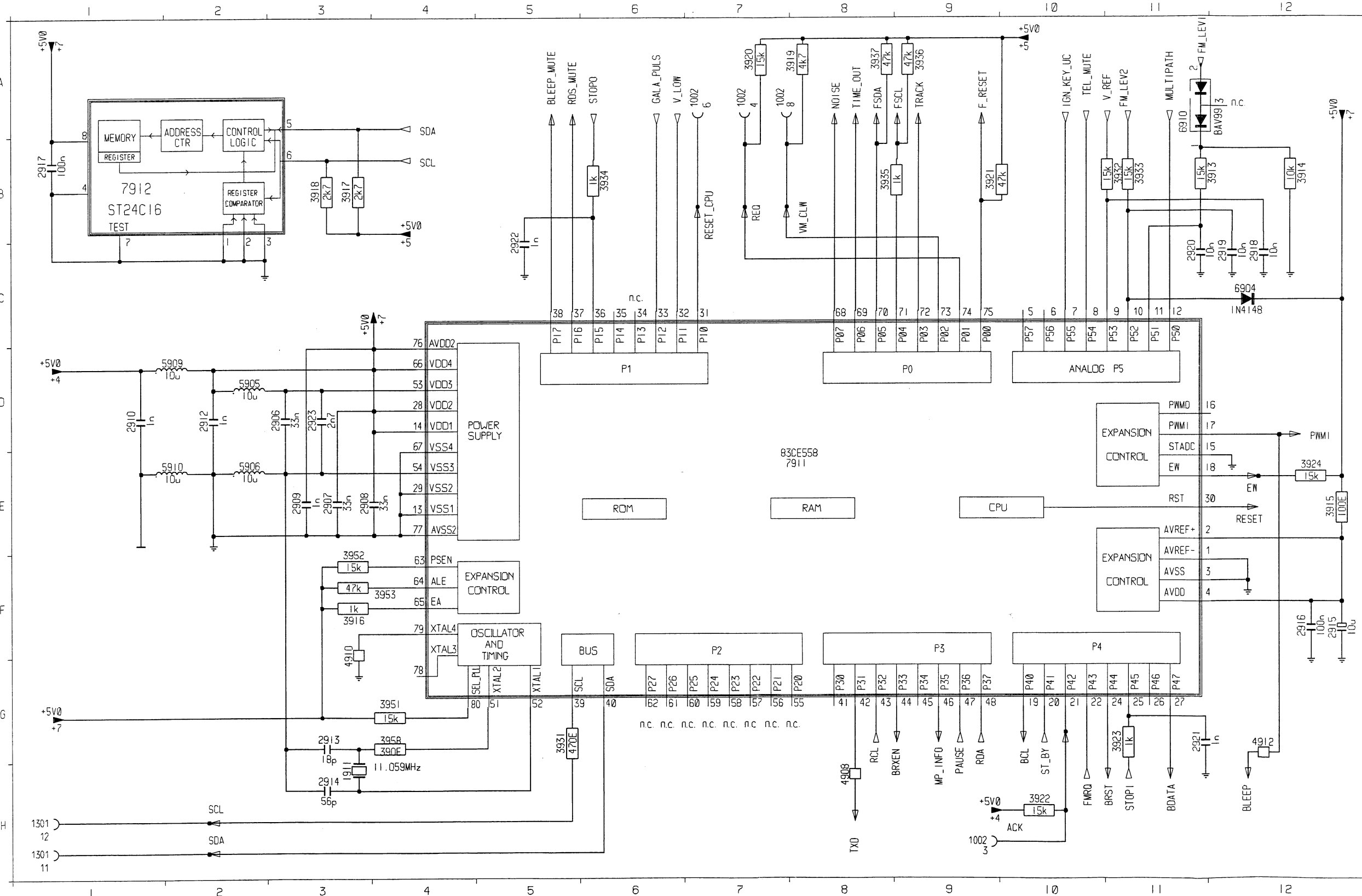
1601	G 6	2609	B 5	2616	G 8	2623	A 1	3605	E 4	3613	C 3	3621	B 9	3628	A 12	3635	B 10	6602	B 5	7606	I 4
2601	E 1	2610	B 6	2617	G 8	2626	C 5	3606	E 3	3614	B 3	3622	C 7	3629	B 7	3636	G 10	6603	A 5	7609	B 11
2602	E 4	2611	E 4	2618	B 10	2627	H 7	3607	E 4	3615	B 2	3623	B 8	3630	B 6	3638	I 2	7601	D 8		
2605	G 3	2612	C 6	2619	B 10	3601	A 2	3608	F 2	3616	G 2	3624	C 6	3631	C 10	3639	H 5	7602	A 2		
2606	G 3	2613	G 5	2620	C 10	3602	D 1	3609	A 3	3617	H 2	3625	G 5	3632	G 10	3641	E 3	7603	B 3		
2607	G 9	2614	G 5	2621	G 10	3603	A 5	3610	C 3	3619	A 7	3626	G 7	3633	A 10	3642	F 3	7604	C 4		
2608	G 9	2615	G 7	2622	E 11	3604	A 5	3612	B 4	3620	E 12	3627	G 8	3634	A 11	6601	B 4	7605	H 3		





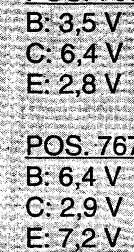
µC

1002 H 9	1911 H 3	2912 D 2	2918 C12	3913 B12	3919 A 8	3931 G 5	3937 A 8	4910 F 3	6904 C12
1002 A 7	2906 D 3	2913 G 3	2919 C12	3914 B12	3920 A 7	3932 B11	3951 G 4	4912 G12	6910 A11
1002 A 7	2907 E 3	2914 H 3	2920 C11	3915 E12	3921 B 9	3933 B11	3952 F 3	5905 D 2	7911 E 7
1002 A 7	2908 E 3	2915 F12	2921 G11	3916 F 3	3922 H10	3934 B 6	3953 F 4	5906 E 2	7912 B 1
1301 H 1	2909 E 3	2916 F12	2922 C 5	3917 B 3	3923 G11	3935 B 8	3958 G 4	5909 D 2	
1301 H 1	2910 D 1	2917 B 1	2923 D 3	3918 B 3	3924 E12	3936 A 9	4908 H 8	5910 E 2	



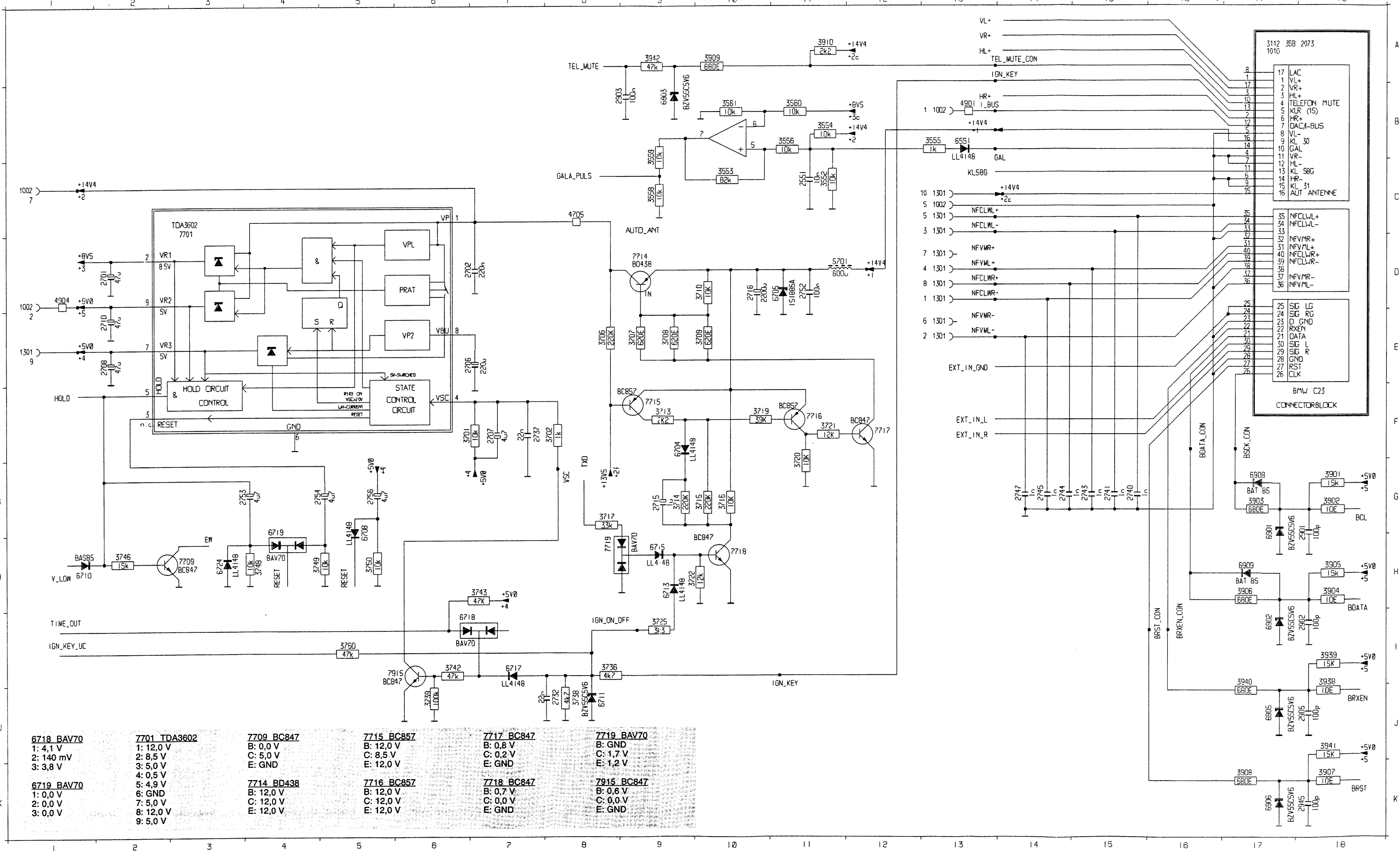
- POS. 6910 BAV99  
 1: 2,0...4,0 V (LEVEL DEP.)  
 2: 2,4...5,0 V (LEVEL DEP.)  
 3: NC
- POS. 7911 83CE558  
 1: GND  
 2: 5,0 V  
 3: GND  
 4: 4,9 V  
 5, 6: nc  
 7: 4,1 V / 0,0 V (IGN\_OFF)  
 8: 5,5 V / 0,0 V (PHONE)  
 9: 3,9 V  
 10: 1,1...4,3 V (LEVEL DEP.)  
 11: 1,4...2,9 V (LEVEL DEP.)  
 12: 0,0...1,0 V (MULTIPATH DEP.)  
 13: GND  
 14: 5,0 V  
 15: GND  
 16: NC  
 17: 4,9 V  
 18: 5,0 V  
 19: 4,8 V  
 20: 0,0 V  
 21, 22: 5,0 V  
 23: NC  
 24: ca. 4,0 V  
 25: 4,9 V / 0,0 V (SEARCH)  
 26: 5,0 V  
 27: 4,8 V  
 28: 5,0 V  
 29: GND  
 30, 31: 0,0 V  
 32: 4,9 V  
 33: 4,0 V  
 34, 35: NC  
 36: 4,9 V / 0,0 V (SEARCH)  
 37: 0,0 V / 4,2 V (SEARCH MUTE)  
 38: 0,0 V  
 39: 4,6 V (SCL)  
 40: 4,9 V (SDA)  
 41: NC  
 42: 4,3 V  
 43: 2,4 V  
 44: ca. 0,5 V  
 45: NC  
 46: 0,0 V  
 47: 4,9 V  
 48: ca. 1,5 V  
 49, 50: NC  
 51: 3,5 V<sub>r</sub> (11 MHz)  
 52: 1,0 V<sub>r</sub> (11 MHz)  
 53: 4,9 V  
 54: 0,0 V  
 55-62: NC  
 63: 5,0 V  
 64: 0,0 V  
 65, 66: 5,0 V  
 67: GND  
 68: 0,0 V  
 69: 4,1 V  
 70, 71: 4,8 V  
 72, 73: 0,0 V  
 74, 75: 4,9 V  
 76: 5,0 V  
 77: GND  
 78: NC  
 79: ND  
 80: 5,0 V (sensitive measuring point !)
- POS. 7912 ST24C16  
 1-4: GND  
 5: 4,9 V (SDA)  
 6: 4,6 V (SCL)  
 7: GND  
 8: 5,0 V

1002	D 5	2302	D 6	2307	F 6	2313	C 9	2318	F 9	2352	D12	2358	F12	2661	C 2	3301	B 8	3357	B12	3663	C 3	3668	E 3	3673	F 1	3678	F 4	6301	C 7	7351	E14
1002	B 1	2303	D 6	2309	C 6	2314	C 9	2319	F 9	2353	E12	2359	B18	2662	D 2	3302	G 8	3557	B 5	3664	C 3	3669	F 3	3674	D 1	3679	E 4	6661	E 1	7661	D 3
1002	F 5	2304	E 6	2310	C 8	2315	F 7	2320	C 6	2354	A14	2360	C18	2663	E 2	3305	B 6	3660	E 2	3665	D 3	3670	E 3	3675	C 4	3680	F 4	6727	A12	7662	F 3
1002	C 1	2305	E 6	2311	C 8	2316	F 8	2323	A 5	2355	G16	2361	D18	2664	F 2	3306	A 5	3661	D 2	3666	E 2	3671	F 3	3676	C 4	3681	E 1	7301	D10	7675	C 4
2301	D 6	2306	F 6	2312	C 8	2317	G 8	2351	B12	2357	C12	2362	F18	2665	F 2	3351	B12	3662	D 2	3667	F 2	3672	C 1	3677	D 4	4303	A 6	7302	A 6	7676	F 4



# POWER SUPPLY / CONNECTOR BLOCK

1002	B13	1301	D13	2701	D 2	2732	J 8	2752	D11	2945	K18	3560	B11	3710	D10	3721	F11	3746	H 2	3904	H18	3939	I18	6551	B13	6717	I 7	6906	K17	7717	F12
1002	D 1	1301	C13	2702	D 7	2737	F 7	2753	G 4	3552	C11	3561	B10	3713	F 9	3722	H 9	3748	H 4	3905	H18	3940	I17	6551	F 9	6718	I 7	6908	G17	7718	H10
1002	C13	1301	E13	2706	E 7	2740	G15	2754	G 5	3553	C10	3701	F 6	3714	G 9	3725	I 9	3749	H 4	3906	H17	3941	J18	6705	D11	6719	G 4	6909	H17	7719	H 8
1002	C 1	1301	D13	2707	F 7	2741	G15	2756	G 5	3554	B11	3702	F 6	3715	G10	3736	I 8	3750	H 5	3907	K18	3942	A 9	6708	G 5	6724	H 3	7701	C 3	7915	I 6
1010	A17	1301	D13	2708	E 2	2743	G15	2901	G18	3555	B13	3705	F 6	3716	G10	3738	J 8	3760	I 5	3908	K17	4705	C 8	6710	H 1	6901	G17	7709	H 3		
1301	D13	1301	E 1	2710	E 2	2744	G14	2902	I18	3556	B11	3707	F 6	3717	G 8	3739	J 6	3901	G18	3909	A10	4901	B13	6711	J 8	6902	I17	7714	D 9		
1301	E13	1301	C13	2715	G 9	2745	G14	2903	B 9	3558	C 9	3708	F 6	3719	F10	3742	I 6	3902	G18	3910	A11	4904	D 1	6713	H 9	6903	B 9	7715	F 9		
1301	C13	2551	C11	2716	D10	2747	G14	2905	J18	3559	B 9	3709	E10	3720	G11	3743	H 7	3903	G17	3938	I18	5701	D11	6715	H 9	6905	J17	7716	F11		





## ELECTRICAL PARTSLIST

## MISCELLANEOUS

1201	4822	242	72076	CRYSTAL	10.700 MHZ
1202	4822	242	72076	CRYSTAL	10.700 MHZ
1203	4822	242	71883	CERAM FILTER	SFE10.7MS318-D
1204	4822	242	71883	CERAM FILTER	SFE10.7MS318-D
1251	4822	242	71874	CRYSTAL	4.000 MHZ
1402	4822	242	72195	CRYSTAL	4.332 MHZ
1601	4822	242	81117	RESONATOR	CSB456F11
1800	4822	242	81646	CRYSTAL	11.059 MHZ
1911	4822	242	81646	CRYSTAL	11.059 MHZ

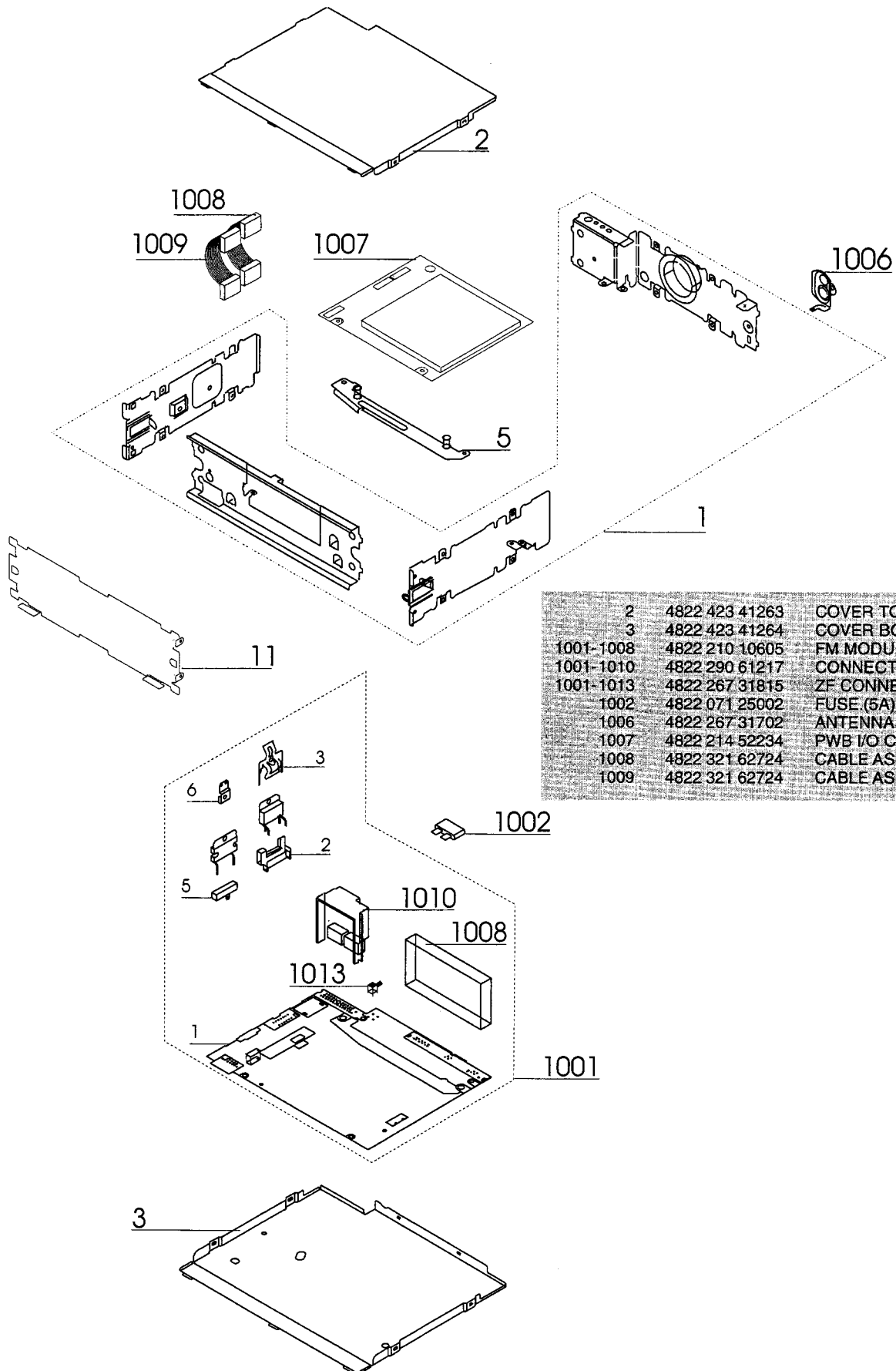
## CAPACITORS

2101	4822	124	23256	CAP.ELECT.	47UF 16V
2102	5322	122	32654	CAP.CHIP	22NF10%X7R 63V
2104	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2106	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2107	5322	122	32654	CAP.CHIP	22NF10%X7R 63V
2108	4822	124	22646	CAP.ELECT.	47UF20% 16V
2109...					
2111	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2201	5322	122	31647	CAP.CHIP	1NF10%X7R 63V
2202	4822	122	32082	CAP.CHIP	4.7PF 5% 50V
2203	5322	122	32659	CAP.CHIP	33PF 5% 50V
2204	5322	122	32448	CAP.CERAMIC	10PF 5% 50V
2205	4822	122	33514	CAP.CHIP	68PF 5%NPO 50V
2206	4822	122	33515	CAP.CHIP	82PF 5%NPO 63V
2207	4822	122	33514	CAP.CHIP	68PF 5%NPO 50V
2208	4822	124	23282	CAP.ELECT.	1UF20% 50V
2209	4822	124	23256	CAP.ELECT.	47UF 16V
2210	4822	122	33496	CAP.CHIP	10NF10%X7R 63V
2211	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2212	4822	122	32916	CAP.CHIP	220NF10%X7R 63V
2213	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2214	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2215	4822	124	23279	CAP.ELECT.	22UF20% 16V
2217	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2218	4822	124	22646	CAP.ELECT.	47UF20% 16V
2219	4822	121	51354	CAP.FOIL	1NF10% 50V
2220	4822	122	33178	CAP.CHIP	1NF 20% X7R 50V
2221	4822	122	33173	CAP.CHIP	560PF 10% X7R 50V
2222	4822	122	32566	CAP.CHIP	3.9NF10%X7R 63V
2223	5322	122	32658	CAP.CHIP	22PF 5% 50V
2225	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2230	4822	122	33178	CAP.CHIP	1NF 20% X7R 50V
2231	4822	122	32082	CAP.CHIP	4.7PF 5% 50V
2232	5322	122	32448	CAP.CERAMIC	10PF 5% 50V
2233	5322	122	32658	CAP.CHIP	22PF 5% 50V
2240	4822	122	32916	CAP.CHIP	220NF10%X7R 63V
2241	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2242	5322	122	31946	CAP.CHIP	27PF 5%NPO 63V
2243	4822	122	33216	CAP.CHIP	270PF 5%NPO 50V
2246	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2251	4822	122	32566	CAP.CHIP	3.9NF10%X7R 63V
2252	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2253	5322	122	32654	CAP.CHIP	22NF10%X7R 63V
2254	4822	122	33608	CAP.CHIP	39NF10%X7R 63V
2255	4822	122	32916	CAP.CHIP	220NF10%X7R 63V
2256	5322	122	32654	CAP.CHIP	22NF10%X7R 63V
2257	4822	124	23281	CAP.ELECT.	33UF20% 16V
2258	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2259	4822	124	80453	CAP.ELECT.	100UF20% 10V
2261	4822	122	32916	CAP.CHIP	220NF10%X7R 63V
2263	4822	051	20008	RES.CHIP	0R00 JUMP. (0805)
2301...					
2306	4822	124	80109	CAP.ELECT.	0.22UF20% 50V
2307	4822	124	80453	CAP.ELECT.	100UF20% 10V
2309	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2310	4822	124	23504	CAP.ELECT.	2.2UF20% 50V
2311	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2312	4822	122	32916	CAP.CHIP	220NF10%X7R 63V
2313	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2314	4822	122	33219	CAP.CHIP	1.8NF10%X7R 50V
2315	4822	124	23504	CAP.ELECT.	2.2UF20% 50V
2316	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2317	4822	122	32916	CAP.CHIP	220NF10%X7R 63V
2318	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2319	4822	122	33219	CAP.CHIP	1.8NF10%X7R 50V
2320	4822	124	23582	CAP.ELECT.	220UF 10V
2323	4822	122	33216	CAP.CHIP	270PF 5%NPO 50V
2351	4822	124	23256	CAP.ELECT.	47UF 16V
2352	4822	124	23504	CAP.ELECT.	2.2UF20% 50V
2353	4822	124	23504	CAP.ELECT.	2.2UF20% 50V
2354	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2355	4822	124	23279	CAP.ELECT.	22UF20% 16V
2357...					
2402	4822	124	23504	CAP.ELECT.	2.2UF20% 50V
2403	4822	124	41017	CAP.ELECT.	10UF 16V
2404	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2405	4822	122	33218	CAP.CHIP	
2406	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2407	4822	122	33216	CAP.CHIP	270PF 5%NPO 50V
2408	4822	124	22646	CAP.ELECT.	47UF20% 16V
2409	4822	124	23504	CAP.ELECT.	2.2UF20% 50V
2410	5322	122	32452	CAP.CERAMIC	47PF 5%NPO 63V
2411	5322	122	31946	CAP.CHIP	27PF 5%NPO 63V
2412	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2413	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2414	4822	124	23504	CAP.ELECT.	2.2UF20% 50V
2420...					
2424	5322	122	33538	CAP.CHIP	150PF 2%NPO 63V
2425	5322	122	32448	CAP.CERAMIC	10PF 5% 50V
2426	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2427	4822	122	32614	CAP.CERAMIC	1.2NF 10% X7R 50V
2428	5322	122	31865	CAP.CHIP	1.5NF10%X7R 63V
2429	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2430	4822	124	23401	CAP.ELECT.	4.7UF20% 25V

2431	4822	124	41017	CAPELECT.	
2432	4822	122	33496	CAP.CHIP	
2433	5322	122	32654	CAP.CHIP	
2434	4822	122	33178	CAP.CHIP	
2435	4822	122	33178	CAP.CHIP	
2601	4822	124	23282	CAP.ELECT.	
2602	4822	122	33514	CAP.CHIP	
2605	4822	122	33496	CAP.CHIP	
2606	4822	124	23281	CAPELECT.	
2607	5322	122	32268	CAP.CHIP	
2608	4822	122	33496	CAP.CHIP	
2609	4822	122	33496	CAP.CHIP	
2610	4822	124	23279	CAPELECT.	
2611	4822	124	30109	CAPELECT.	
2612	4822	122	33496	CAP.CHIP	
2613	4822	122	32916	CAP.CHIP	
2614	5322	122	32654	CAP.CHIP	
2615	4822	122	33496	CAP.CHIP	
2616	4822	051	20153	RES.CHIP	
2617	5322	122	32531	CAP.CHIP	
2618	5322	122	31866	CAP.CHIP	
2619	5322	122	31866	CAP.CHIP	
2620	5322	122	31863	CAP.CHIP	
2621	5322	122	31863	CAP.CHIP	
2622	5322	126	10223	CAP.CHIP	
2623	4822	122	33178	CAP.CHIP	
2626	4822	122	33216	CAP.CHIP	
2627	4822	051	20008	RES.CHIP	
2661	4822	124	23504	CAP.ELECT.	
2662	4822	122	33178	CAP.CHIP	
2663	4822	124	22646	CAPELECT.	
2664	4822	124	23504	CAP.ELECT.	
2665	4822	122	33178	CAP.CHIP	
2701	4822	124	22646	CAP.ELECT.	
2702	4822	122	32916	CAP.CHIP	
2706	4822	124	40196	CAP.ELECT.	
2707	4822	124	23401	CAPELECT.	
2708	4822	124	22646	CAP.ELECT.	
2710	4822	124	22646	CAPELECT.	
2715	4822	124	23282	CAP.ELECT.	
2732	4822	122	31977	CAP.CHIP	
2737	5322	122	32654	CAP.CHIP	
2740...					
2747	5322	122	31647	CAP.CHIP	
2752	4822	122	33496	CAP.CHIP	
2753...					
2756	4822	124	23401	CAPELECT.	
2800...					
2803	4822	122	33216	CAP.CHIP	
2804	4822	122	33496	CAP.CHIP	
2806	4822	122	33178	CAP.CHIP	
2807	4822	122	33177	CAP.CHIP	
2808	4822	122	33178	CAP.CHIP	
2809	4822	122	33515	CAP.CHIP	
2810	4822	122	33216	CAP.CHIP	
2812	4822	122	33496	CAP.CHIP	
2813	4822	122	33173	CAP.CHIP	
2814	4822	122	33173	CAP.CHIP	
2815	5322	122	32661	CAP.CHIP	
2816	5322	122	32965	CAP.CERAMIC	
2818	4822	122	33496	CAP.CHIP	
2820	4822	122	33219	CAP.CHIP	
2821	4822	122	33219	CAP.CHIP	
2822	4822	122	33178	CAP.CHIP	
2823	4822	124	11453	CAP.TANTAL	
2824	4822	122	33173	CAP.TANTAL	
2825	4822	122	33219	CAP.CHIP	
2826	4822	124	11453	CAP.TANTAL	
2827	4822	122	33173	CAP.CHIP	
2828	4822	122	33219	CAP.CHIP	
2829	4822	124	11453	CAP.TANTAL	
2830	4822	122	33173	CAP.CHIP	
2831	4822	122	33219	CAP.CHIP	
2832	4822	124	11453	CAP.TANTAL	
2833	4822	124	11453	CAP.TANTAL	
2836	4822	122	33216	CAP.CHIP	
2837	4822	122	33216	CAP.CHIP	
2841...					
2844	4822	122	33178	CAP.CHIP	
2846	4822	124	22646	CAPELECT.	
2848	4822	124	22646	CAPELECT.	
2850	4822	122	33216	CAP.CHIP	
2864	4822	122	33496	CAP.CHIP	
2865	4822	122	33178	CAP.CHIP	
2867	4822	124	22646	CAPELECT.	
2868	4822	124	23504	CAPELECT.	
2880	4822	122	33496	CAP.CHIP	
2881	4822	122	33496	CAP.CHIP	
2885	4822	122	33178	CAP.CHIP	
2886	4822	122	33178	CAP.CHIP	
2887	4822	124	23504	CAP.ELECT.	
2888	4822	124	23504	CAP.ELECT.	
2889	4822	122	33216	CAP.CHIP	
2895	4822	122	33178	CAP.CHIP	
2896	4822	122	33178	CAP.CHIP	
2897	4822	124	23504	CAPELECT.	
2898	4822	124	23504	CAP.ELECT.	
2899	4822	122	33216	CAP.CHIP	
2901	5322	122	32531	CAP.CHIP	
2902	5322	122	32531	CAP.CHIP	
2903	4822	122	33496	CAP.CHIP	
2905	5322	122	32531	CAP.CHIP	
2906...					
2908	4822	122	33342	CAP.CHIP	
2909...					
2912	4822	122	33178	CAP.CHIP	

2913	5322	122	32965	CAP.CERAMIC	18PF 5%NPO 50V
2914	5322	122	32661	CAP.CHIP	56PF 5% 50V
2915	4822	124	41017	CAPELECT.	10UF 16V
2916	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2917	4822	122	33496	CAP.CHIP	100NF10%X7R 63V
2918...					
2920	4822	122	33177	CAP.CHIP	10NF 20% X7R 50V
2921	4822	122	33178	CAP.CHIP	1NF 20% X7R 50V
2922	4822	122	33178	CAP.CHIP	1NF 20% X7R 50V
2923	4822	122	32627	CAP.CERAMIC	2.7NF10%X7R 50V
2945	5322	122	32531	CAP.CHIP	100PF 5%NP0 50V

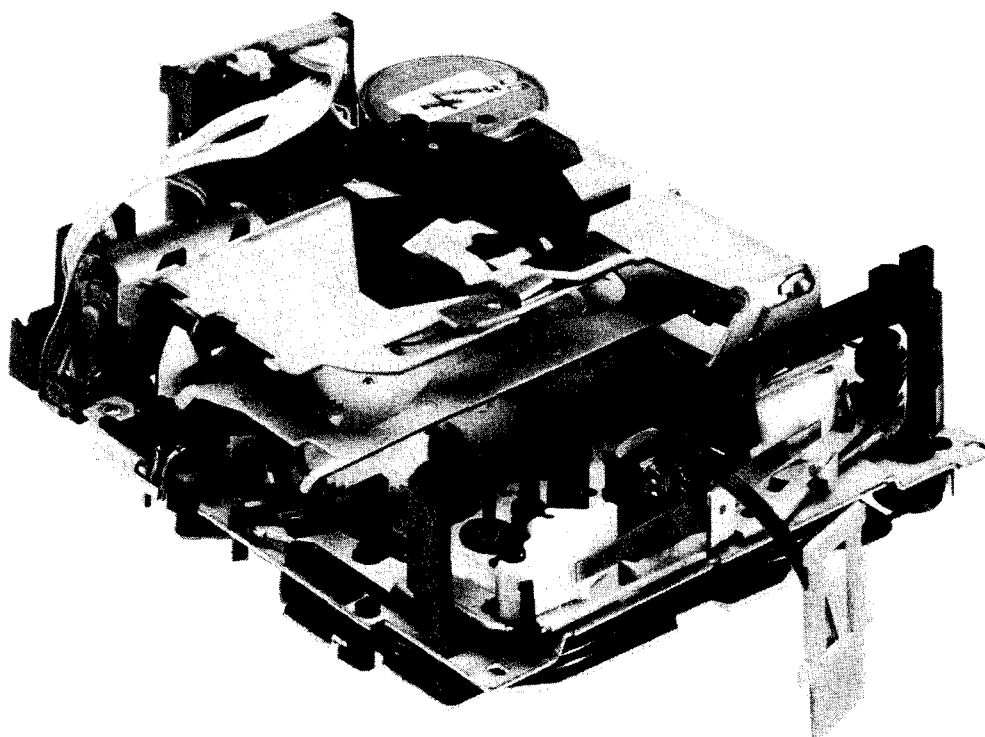
## MECHANICAL PARTS



Service  
Service  
**Service**

# Service Manual

12 V 





## MECHANICAL SPECIFICATION

Operating positions:	Any position from horizontal to 45° standing vertically on the rear side.
Operating temperature:	-20°C to +70°C
Tape speed:	4,76 cm/sec
Wow and flutter:	< 0,5% unweighted < 0,3% weighted
Winding time:	
Test tape: RCA 118 ( C60 )	< 110 sec
Eject and loading time:	< 2 sec

## ELECTRICAL SPECIFICATION

Voltage:	min 10,6 V max 16,0 V
Current - playback:	200 mA
Current - fast wind:	150 mA
Current - eject, standby:	100 µA
Hold in voltage:	8,0 V
Capstan motor:	14,4 V
Servo motor:	2 V DC Play 11,5 V DC Fast, Servo
Playback Crosstalk	
ch. 1 - 2 / 3 - 4	> 36 dB
ch. 2 - 3	> 46 dB

## FEATURES

The SCA-4.4 tape deck is usable in several sets. Most of the control functions depend on the hard- and software-configuration of the set in which the deck is installed.

The set µC can control soft eject, emergency eject, standby mode, reverse function, MSS, ME/FE and DOLBY indication.

Some versions of the deck could be equipped with a grooved head and/or a preamplifier circuit.

## HANDLING AND DEMOUNTING INSTRUCTIONS

### GENERAL

- Protect the tape deck against ESD !
- Plastic catches and snap connections must be released careful with screwdriver or tweezers.
- Cables must be laid in the defined cable guidings after mounting.
- For lubrication see indications in the exploded view.
- To clean tape transport and head only use moist cleaning tapes or piece of cloth, take care that no fluid (alcohol) drops into the bearing.
- For transport lift/carrier assy must be in eject position, do not carry the deck by touching the lift/carrier.
- Use a screwdriver 2,5 mm with insulated shaft for adjusting drift.
- Screw the deck into the set in order: Front right, front left, rear left, rear right.

## DEMOUNTING

1. Carrier/lift (44)
  - 1.1 Lift in eject position - put leg of eject spring (12) into mounting position acc. fig. 8 and fig. 2 - J
  - 1.2 Lift in play position - unclamp cassette holder (49) from eject lever (48) with a left-upwards motion acc. fig.1-B
  - 1.3 Lift in eject position - push plastic hook (fig.1-D) and pull out eject lever, remember position of ejector spring (55) and switching pin (54) for re-assembly later on
  - 1.4 Release fixation lever (fig.1-F) by clicking out in left direction and then turn to the right
  - 1.5 Lift in mid position - take out carrier and lift by releasing plastic hooks at the left (fig.1-G)
2. Head support
  - 2.1 Take out carrier/lift according 1.
  - 2.2 Remove head carrier spring (37)
  - 2.3 Turn head support fixation lever acc. fig.3-A
  - 2.4 Position pin of switching lever (20) to max. left point, see fig.3-detail I
  - 2.5 Release plastic snapper (fig.3-H) and take out head support assembly  
!!! TAKE CARE NOT TO BENT THE HEAD CARRIER !!!
  - 2.6 Press plastic fixation (fig.3-detail E,F) and take out magnetic head
  - 2.7 Push pressure spring (27) acc. fig.3-D and move it out
  - 2.8 Release plastic hooks (fig.3-B,C) to pull pinch rollers (45+68) out
  - 2.9 Take off anchor spring (13), rotate anchor (2) 90°degrees to take it out (fig.4-A,B,C)
3. Capstan motor (32)

Remove belt (30) from driving wheel, desolder connection cables, unscrew the two torx screws at the bottom of chassis and take out capstan motor  
!!! TAKE CARE OF CORRECT AND UNTWISTED MOUNTING OF THE BELT !!!
4. Servo motor (14)

Desolder connection cables and lever up motor out of its clamps (fig.2-F,G)
5. Clutch assy (57-59)
  - 5.1 Remove servo motor acc. 4.
  - 5.2 Cut disk (65) and remove it (must be renewed)
  - 5.3 Pull clutch from the axle (fig.2-H,I)
6. Anchor holder (8) and magnet double (1)
  - 6.1 Desolder cables of magnet
  - 6.2 Swivel anchor holder counter-clockwise and press it off applying force near the pivoting point
  - 6.3 Release plastic clamps of magnet holder and press magnet out from top of the chassis (fig.4-E)
7. Driving belt (30), flywheels (23) and bearings (70)
  - 7.1 Release pivot plate (35) by turning the plastic hooks acc.fig.5-A,B
  - 7.2 Remove pivot plate and driving belt
  - 7.3 Pull out flywheels
  - 7.4 Press bearings out of plastic housings from top side of chassis plate, use a plastic tool with diameter 4mm in order not to damage the housings
  - 7.5 After mounting new flywheels, bearings or pivot plate you have to test wow and flutter because every deck is adjusted individual for these components. If the values of wow and flutter are out of specification, you have to exchange complete deck !
  - 7.6 Degrease capstan axis after re-mounting the flywheels
8. Connection wheel (5), take up wheels (6), backtension springs (69)
  - 8.1 Take out carrier/lift acc. 1.
  - 8.2 Lever up connection wheel from axle (must be renewed)
  - 8.3 Cut disks (65) and remove them (must be renewed)
  - 8.4 Unclamp and pull up wheels with puller (fig.2-A,B)
  - 8.5 Take out backtension springs
9. ME/CR Switch (60)
  - 9.1 Desolder connection cables
  - 9.2 Push with a small pin through the hole at the bottom of the chassis, directly under the switch

10. ON/OFF Switch (26)
- 10.1 Desolder connection cables
- 10.2 Lever up switch or push with a small pin through the hole at the bottom of the chassis, directly under the switch if servo motor and clutch were removed previously
11. Control pins (16), gear lever (17), play reverse lever (18)
- 11.1 Remove flywheels acc. 7
- 11.2 Remove play reverse lever
- 11.3 Put control pins into mounting position acc. fig.6-D,E
- 11.4 Take out gear lever
- 11.5 Pull out control pins
12. Switching lever (20), swivel wheel assembly (7,15,43)
- 12.1 Release spring (53) from black plastic pin
- 12.2 Turn switching lever acc. fig.7-A
- 12.3 Lever up switching lever from axle
- 12.4 Remove connection wheel acc. 8
- 12.5 Take out swivel wheel assembly
13. Switching pin (54), transport rod (25), latch (21)
- 13.1 Remove ON/OFF Switch acc. 10
- 13.2 Lever up switching pin from axle
- 13.3 Remove switching lever acc. 12
- 13.4 Move out transport rod and latch

#### TOOLS REQUIRED

Test cassette SBC 420	4822 397 30071
Test cassette SBC 419	4822 397 30069
Friction test cassette	4822 395 30054
Puller for clutch (fig.2)	4822 395 60039

#### ADJUSTMENTS

##### TORQUE OF REELS (FRICTION)

Adjust potmeter pos. 3409 until friction test cassette shows 9,5 +/- 1,5 mNm in NOR direction (after 2 minutes) and 8,5 +/- 1,5 mNm in REV direction. Backtension must be 0,3 to 0,7 mNm.  
If values deviate check lubrication, clutch, take up wheels and backtension springs.

##### WOW AND FLUTTER, TAPE SPEED

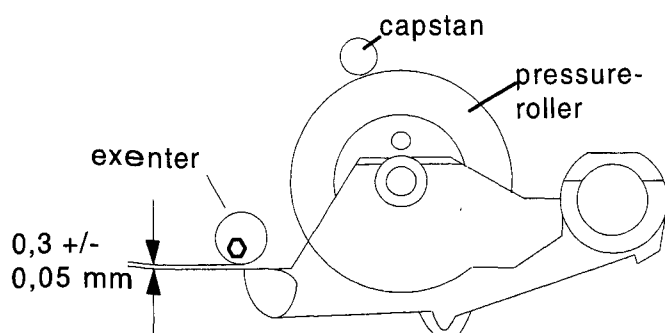
Connect wow and flutter meter to loudspeaker outputs and play the 3150 Hz signal track of test cassette SBC 420. Value should be max. 0,5% (unweighted).

If value deviates check motors, pressure rollers, flywheels, belt, pulley and backtension springs.

Tape speed can be adjusted with motor potentiometer A (see fig.8). Use a screwdriver with insulated shaft !

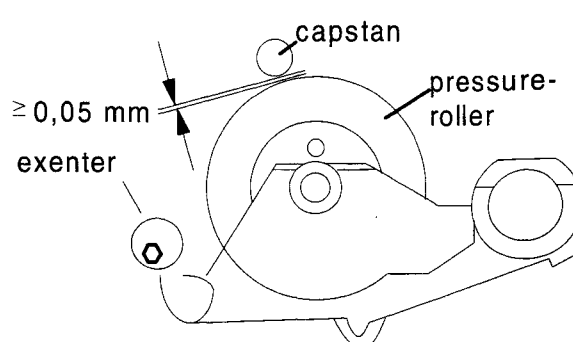
##### PRESSURE ROLLER / CAPSTAN (see figures below)

Adjust clearance play-NOR position between pressure roller and stop head carrier



SCA-4.4

Adjust clearance FFW position between pressure roller and capstan



EJECTOR 48, HOLDER 49, LIFT 44

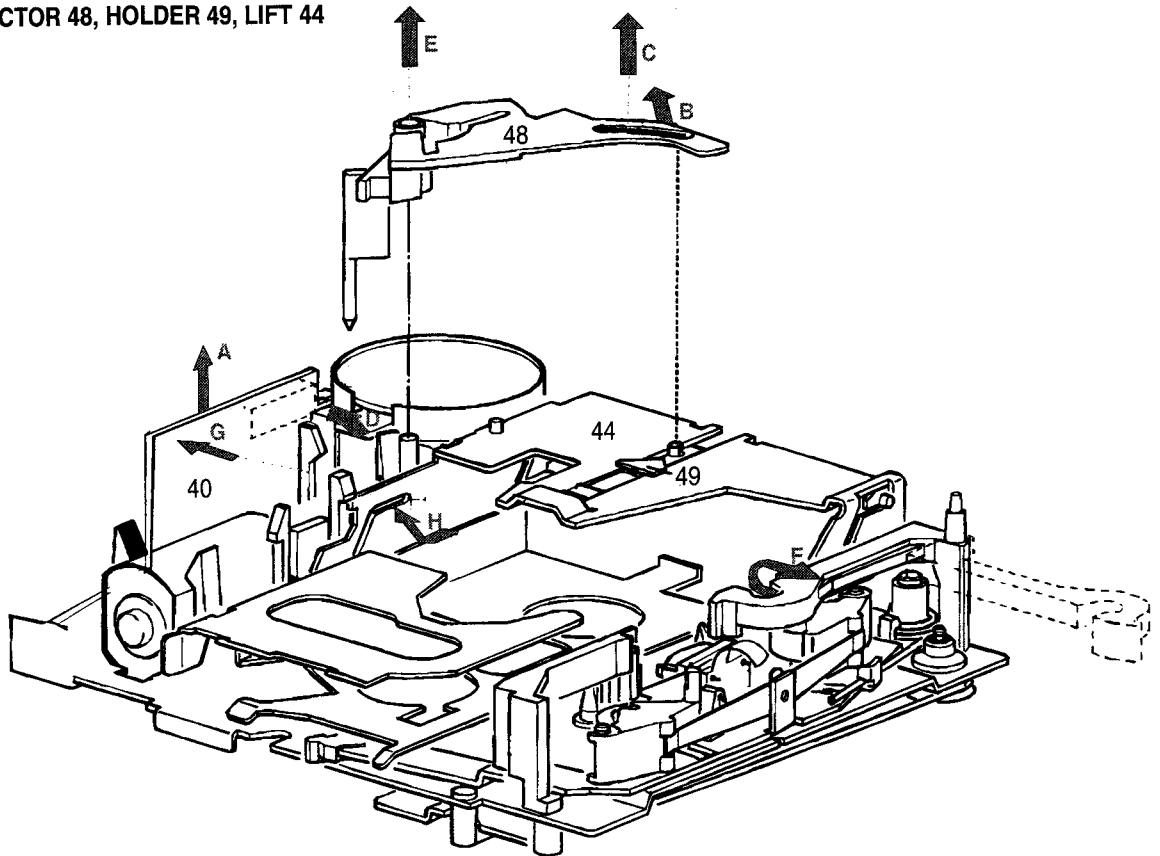


Fig. 1

CLUTCH 59, SWITCH 60, GEAR WHEEL 5, CARRIER 6

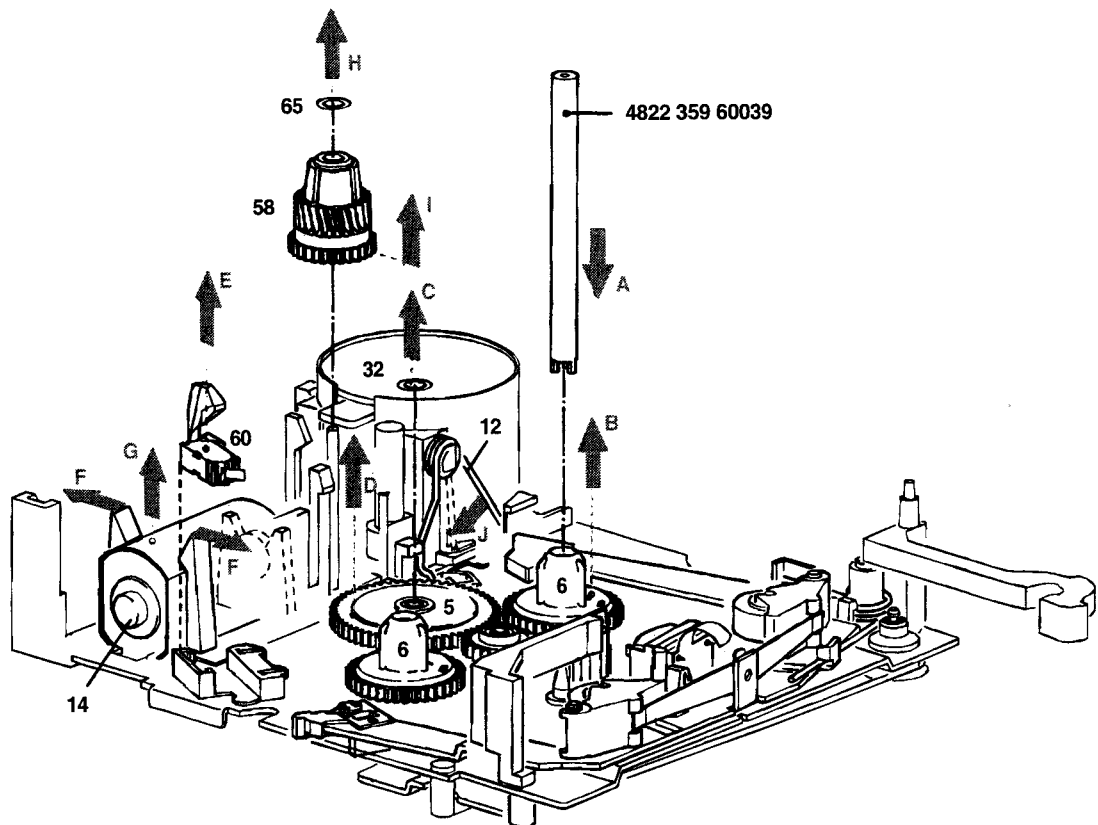


Fig. 2

PRESSURE ROLLER 45, HEAD BRACKET 33, HEAD 34

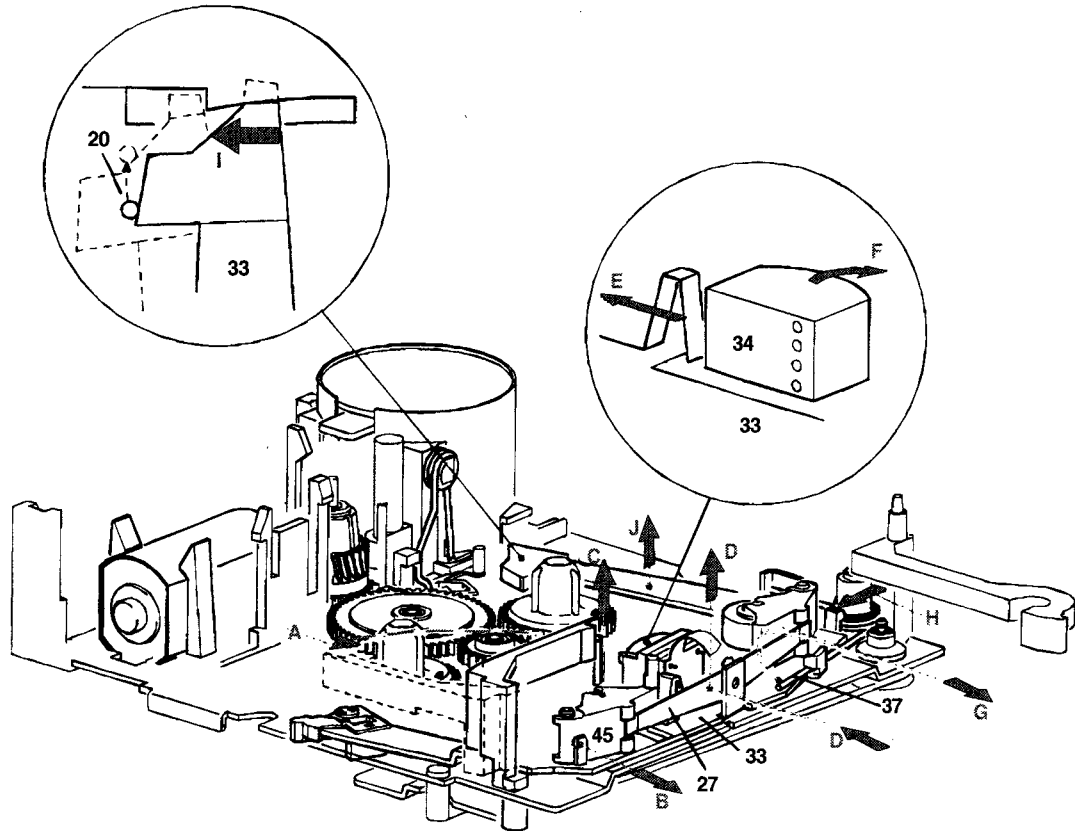


Fig. 3

ANCHOR 3/5, RELAY 1

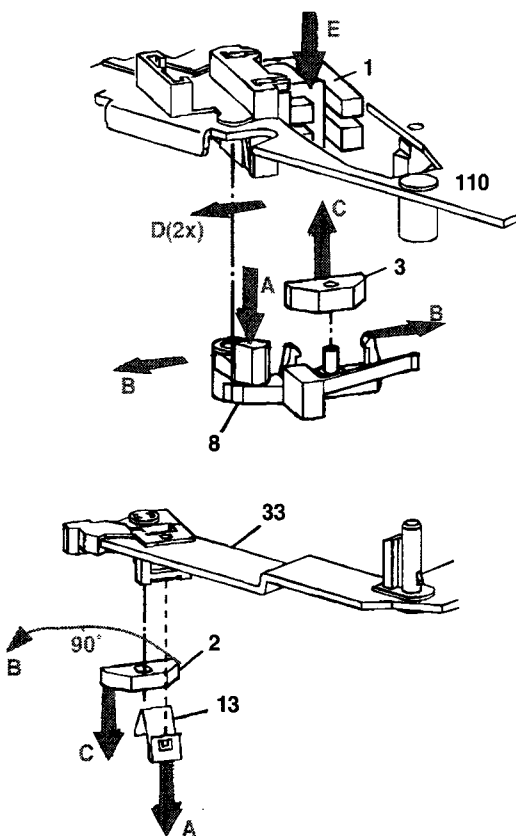


Fig. 4

FLYWHEEL 23, BELT 30

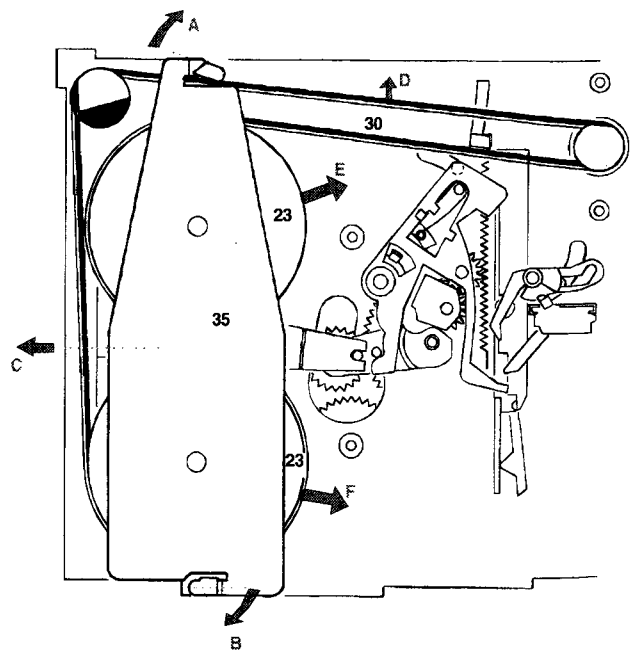


Fig. 5

SEGMENT 16, BRACKET 17, BEARING 70

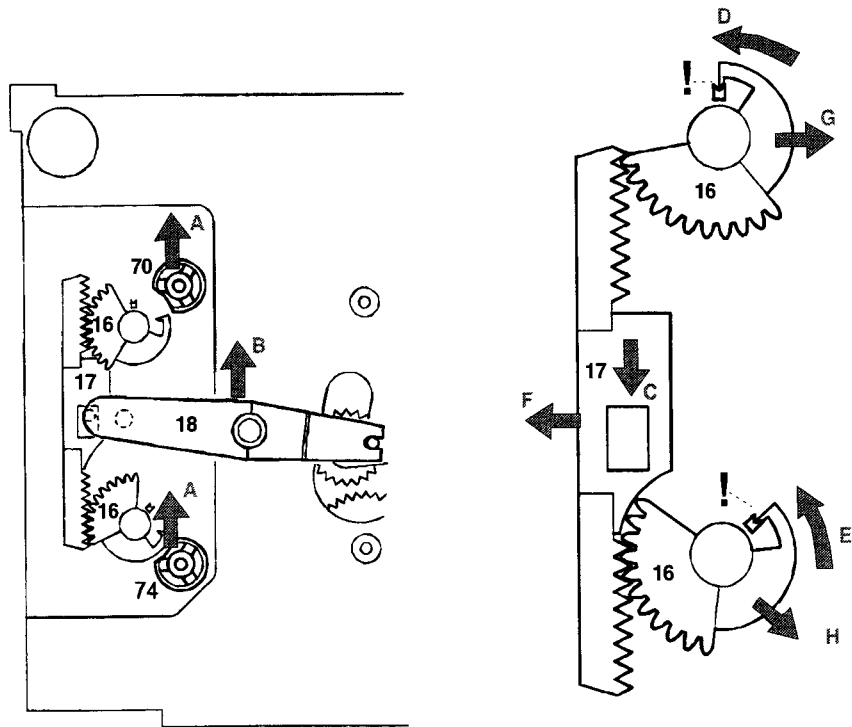


Fig. 6

SWITCH 26, SWIVEL GEAR 7, LEVER 20

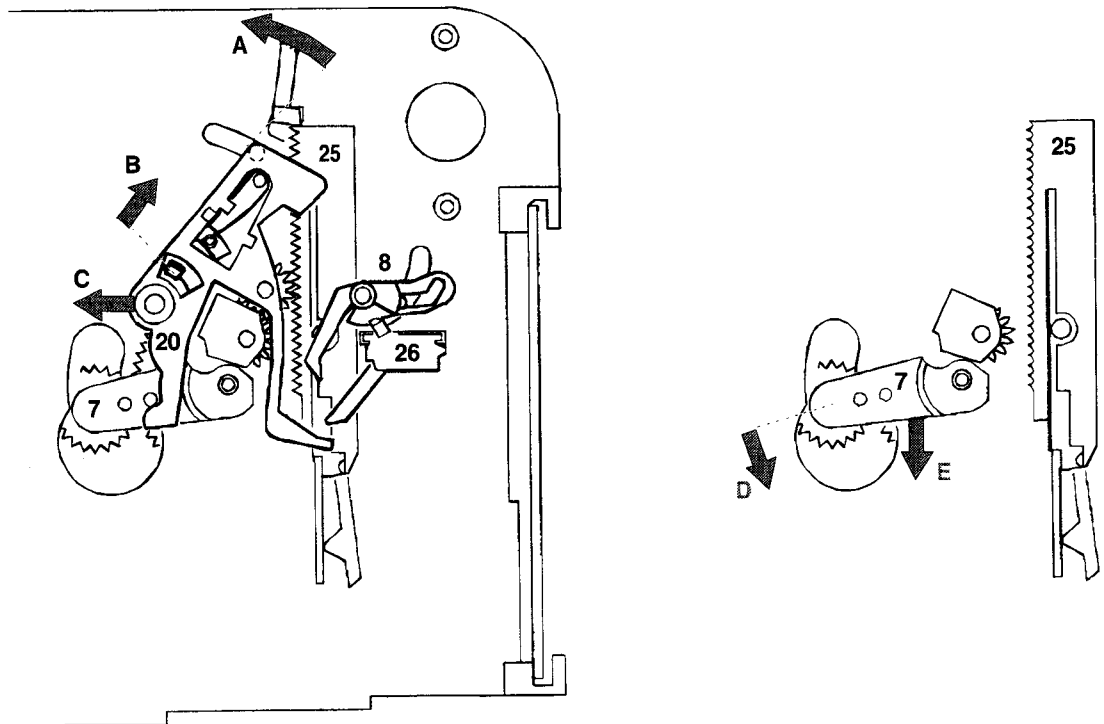


Fig. 7

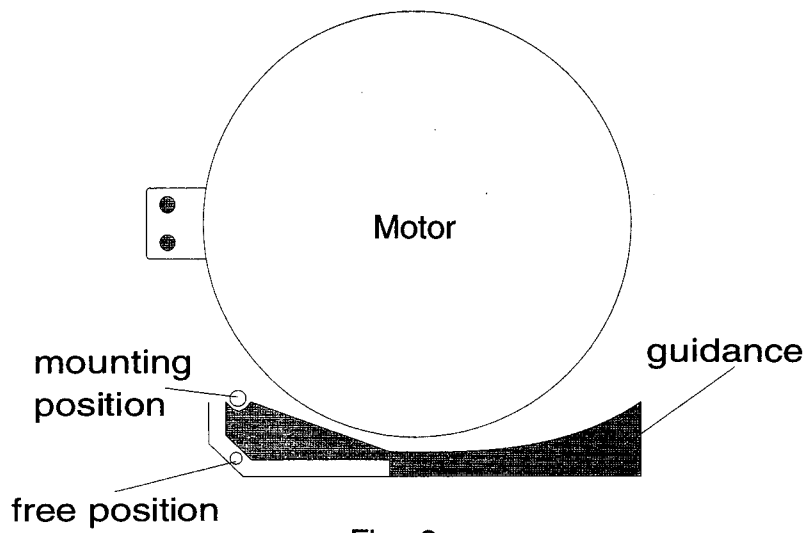
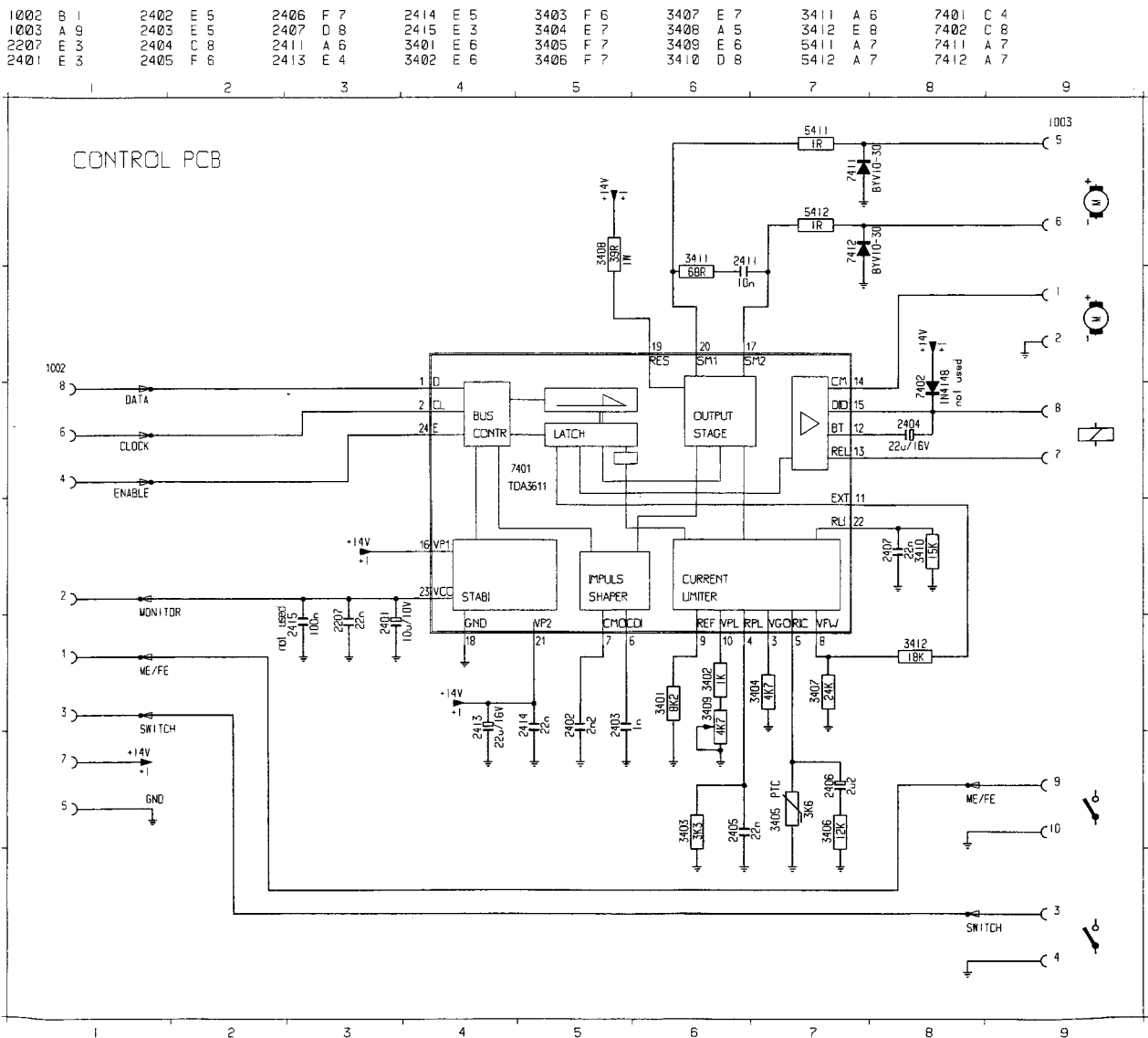


Fig. 8



## MEASUREMENTS ON CONTROL PCB

ME/FE: 0,0 V (FE) / 5,0 V (ME/CR)

ON/OFF: 0,0 V (ON) / 5,0 V (OFF)

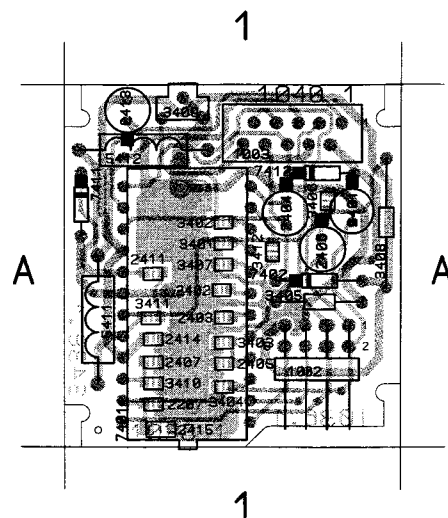
Pos. 7401 TDA 3611

- 1: 5,0 V
- 2: 5,0 V
- 3: 0,7 V / 0,0 V (Sb)
- 4: 0,8 V (PN) / 0,9 V (PR) / 0,3 V (W) / 0,0 V (Sb)
- 5: 0,8 V (PN) / 1,0 V (PR) / 0,4 V (W) / 0,0 V (Sb) / 0,1 V (TA)
- 6: 0,8 V (PN) / 1,0 V (PR) / 0,4 V (W) / 0,0 V (Sb) / 0,1 V (TA)
- 7: 0,7 V (P) / 1,8 V (W) / 0,0 V (Sb) / 0,6 V (TA)
- 8: 3,4 V / 0,0 V (Sb)
- 9: 1,2 V / 0,0 V (Sb)
- 10: 0,5 V / 0,0 V (Sb)
- 11: 3,4 V / 0,0 V (Sb)
- 12: 12,0 V
- 13: 0,5 V / 12,0 V (Sb)
- 14: 0,0 V / 11,5 V (P)
- 15: 11,5 V / 12,0 V (Sb)
- 16: 12,0 V
- 17: 0,1 V (PN) / 2,4 V (PR) / 0,0 V (WN) / 12,0 V (WR) / 0,0 V (Sb)
- 18: GND
- 19: 12,0 V / 8,5 V (P)
- 20: 2,4 V (PN) / 0,1 V (PR) / 12,0 V (WN) / 0,0 V (WR) / 0,0 V (Sb)
- 21: 12,0 V
- 22: 3,6 V (P) / 1,3 V (W) / 0,0 V (Sb)
- 23: 5,0 V
- 24: 5,0 V

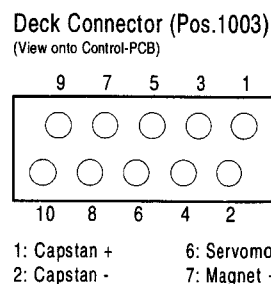
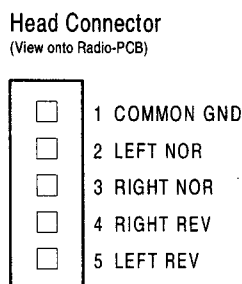
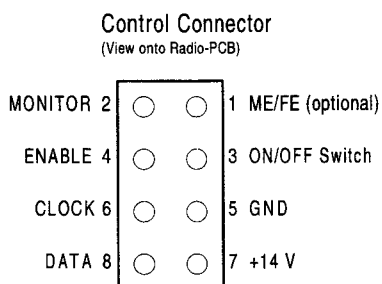
**All values measured DC - GND**

(P) = Play mode both directions  
(W) = Wind mode both directions  
(PN) = Play NOR direction  
(PR) = Play REV direction  
(WN) = Wind NOR direction  
(WR) = Wind REV direction  
(Sb) = Standby  
(TA) = Traffic announcement

1002 A 1	2413 A 1	3409 A 1
1003 A 1	2414 A 1	3410 A 1
2207 A 1	2415 A 1	3411 A 1
2401 A 1	3401 A 1	3412 A 1
2402 A 1	3402 A 1	5411 A 1
2403 A 1	3403 A 1	5412 A 1
2404 A 1	3404 A 1	7401 A 1
2405 A 1	3405 A 1	7402 A 1
2406 A 1	3406 A 1	7411 A 1
2407 A 1	3407 A 1	7412 A 1
2411 A 1	3408 A 1	



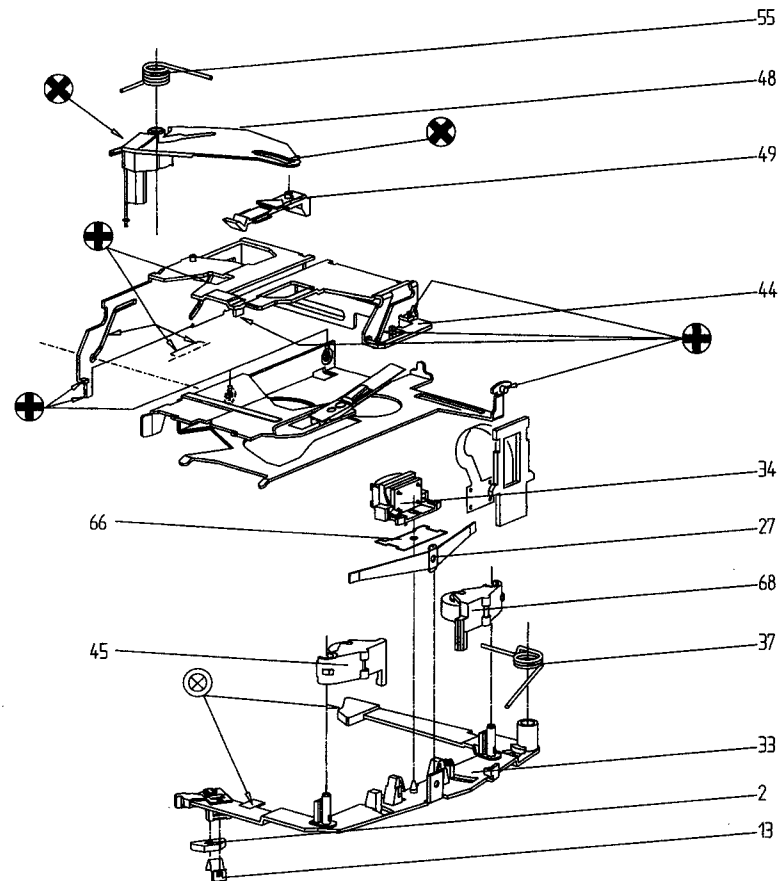
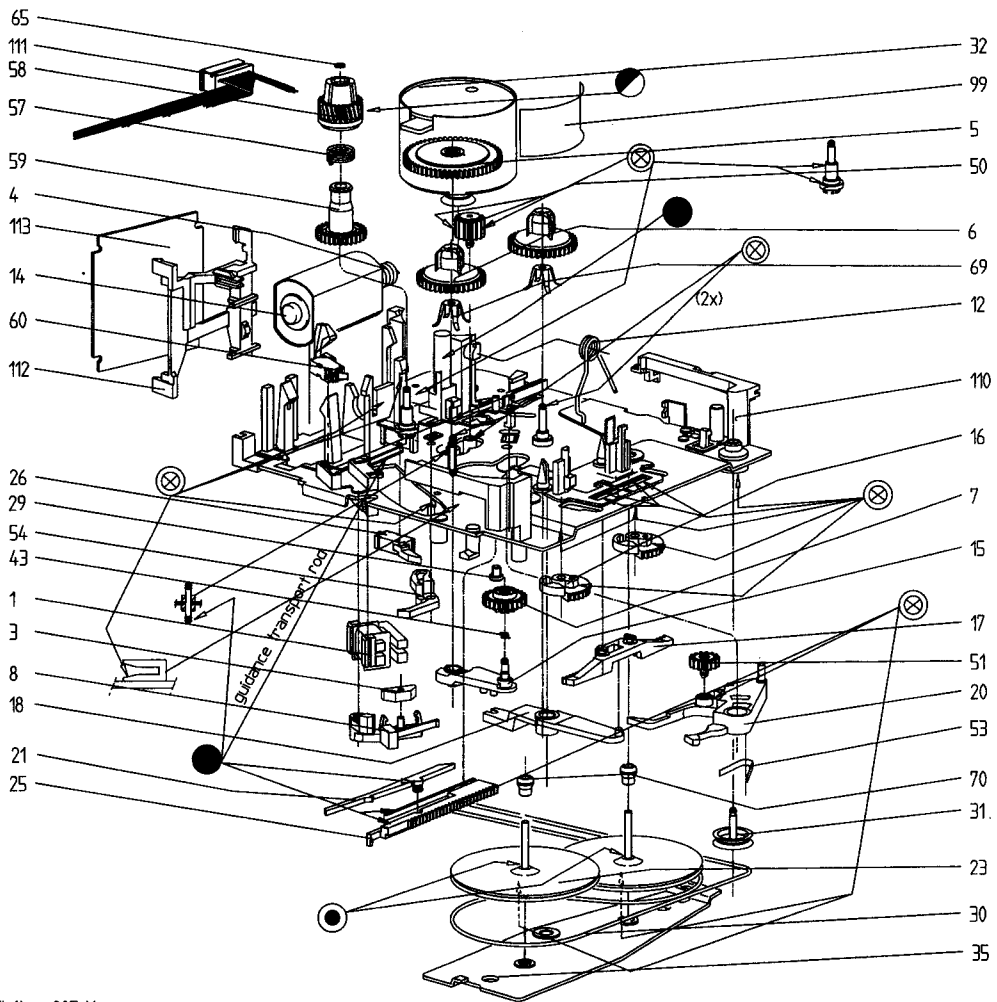
## CONNECTORS



- |                  |                 |
|------------------|-----------------|
| 1: Capstan +     | 6: Servomotor - |
| 2: Capstan -     | 7: Magnet -     |
| 3: ON/OFF Switch | 8: Magnet +     |
| 4: GND           | 9: ME/FE Switch |
| 5: Servomotor +  | 10: GND         |

Front of Radio ↓





- ⊕ Gleitmo 805 K
- Mobil SHC 634
- Contact Oel PDP 65
- ⊗ Topas L30
- ⊗ Gleitmo 585 K
- SM30 TF

## MECHANICAL PARTS

1	4822 281 11051	DOUBLE
2	4822 404 21083	ANCHOR ON SUPPORT 33
3	4822 404 21084	ANCHOR IN HOLDER 8
5	4822 522 32868	WHEEL IDLER
6	4822 528 10776	CARRIER
7	4822 528 70658	ASSY
8	4822 404 21087	FOR ANCHOR 2
1	4822 492 70556	FOR ANCHOR 2
14	4822 361 30297	SERVO ASSY
16	4822 522 32869	NORMAL/REVERSE
17	4822 404 21089	DRIVING 16
20	4822 404 21086	ASSY SERVO GEARWHEEL
23	4822 528 81378	FLYWHEEL
26	4822 277 11215	ON/OFF
27	4822 492 70557	FOR PRES. ROLLER 45
29	4822 502 12548	FIX MOTOR 32
30	4822 358 31053	BELT, DRIVING
31	4822 528 81144	DIVERTING BELT
32	4822 361 30294	CAPSTAN
33	4822 404 21088	FOR HEAD,PRES.ROLLR
34	4822 249 30157	WITH FLEXPRINT
44	4822 466 82631	FOR CASSETTE
45	4822 528 81377	REVERSE
48	4822 404 21091	EJECT
49	4822 404 21092	HOLDING CASSETTE
50	4822 522 32871	COUPLING
59	4822 522 10435	ASSY
60	4822 277 11216	ME/CR
65	4822 532 52348	FOR CARRIER CLUTCH
68	4822 528 81449	NORMAL
69	4822 492 70926	UNDER CARRIER
70	4822 520 30539	FOR FLYWHEEL
111	4822 321 61954	CABLE, CONNECT
112	4822 256 92048	FOR PCB
113	4822 214 52077	PCB KOMPL.

## ELECTRICAL PARTS

2207	5322 122 32654	22NF10%X7R 63V
2401	4822 124 22748	10UF 10V
2402	4822 122 33127	2,2NF10%X7R 63V
2403	4822 122 33178	1NF 20% X7R 50V
2404	4822 124 23279	22UF20% 16V
2405	5322 122 32654	22NF10%X7R 63V
2406	4822 124 41013	2,2UF 25V
2407	5322 122 32654	22NF10%X7R 63V
2411	4822 122 33177	10NF 20% X7R 50V
2413	4822 124 23279	22UF20% 16V
2414	5322 122 32654	22NF10%X7R 63V
3401	4822 051 20822	8K20 5% 0,1W
3402	4822 051 20102	1K00 5% 0,1W
3403	4822 051 20332	3K30 5% 0,1W
3404	4822 051 20472	4K70 5% 0,1W
3405	4822 116 40241	3K6 PTC
3406	4822 051 20123	12K00 5% 0,1W
3407	4822 051 20243	24K00 5% 0,1W
3408	4822 053 10399	39R00 5% 1W
3409	5322 101 11014	5K POTMETER
3410	4822 051 20153	15K00 5% 0,1W
3411	4822 051 20689	68R00 5% 0,1W
3412	4822 051 20183	18K00 5% 0,1W
5411	4822 050 21008	1R00 1% 0,6W
5412	4822 050 21008	1R00 1% 0,6W
7401	4822 209 32207	TDA3611
7411	4822 130 32911	BYV10-30
7412	4822 130 32911	BYV10-30
AIDS AND TOOLS		
100	4822 390 10107	ISOFLEX PDP65
101	4822 390 20128	TOPAS L30
103	4822 390 10123	MOBIL OIL SHC 634
104	4822 390 20027	GLEITMO 805K
105	4822 390 20128	L30 TF
107	4822 390 20139	GLEITMO 585K